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A CRITICAL EXAMINATION of the METHODS of RECORDING and PUBLISHING STATISTICAL DATA bearing on PUBLIC HEALTH; with SUGGESTIONS for the IMPROVEMENT of such METHODS.

By REGINALD DUDFIELD, M.A., M.B.

[Read before the Royal Statistical Society, 17th January, 1905.
Mr. J. A. BAINES, C.S.I., Vice-President, in the Chair.]

It is profitable to turn occasionally from the discussion of the collected statistics, and to consider whether any improvements are necessary or desirable in the collection, registration and mode of presentation of the statistical data themselves, and whether any additional sources of information are available. The present juncture appears to be especially appropriate for such consideration. During the past autumn the Report of the Inter-Departmental Committee on Physical Deterioration has been issued, and recommendations are to be found therein which will, if carried into effect, considerably widen the scope of our national statistics. Next August the Conference of the International Statistical Institute will be held in this Metropolis, when the subject now before you will receive special attention. The work of the Census of 1901 has been completed only recently, and the valuable experience derived from the operations connected therewith is still fresh in the minds of the various officials who have so ably carried out the work, some of which experience will, I hope, be laid before us in the course of discussion. Lastly, Parliament will have to legislate during the coming session for a census or enumeration of the inhabitants of the Metropolis for the purposes of the equalisation of rates, when a strong effort will doubtless be made to secure the extension of the census to the whole country.

I have been unable to find any previous communication to this Society on my subject as a whole. I have therefore been obliged to formulate a scheme which will, I hope, put the various questions to be submitted for discussion in a systematic and comprehensive way.

I propose to consider the matter under two main heads, viz. :—

- (a.) The methods of registering and collecting the data themselves; and
- (b.) The form of presentation or publication of the recorded data.

For a due appreciation of the present system it will be necessary to give some portion of the history of civil registration and of the formation of the different areas into which the country is subdivided. The historical parts will be made as brief as possible. The suggestions for improvements will be given immediately after the criticism of each detail, but the various suggestions will be summarised at the end of the paper. It is hoped that such an arrangement will facilitate discussion, by separating facts which are common knowledge from the proposals for which discussion is particularly sought.

Definition of Vital Statistics.—I have found it somewhat difficult to decide what data should be included under the designation of “vital statistics.” In common language that term is applied to statistics relating to births, deaths, marriages, and sickness. “Health,” however, is the result of the interactions of many factors, the majority of which can be reduced to statistical bases, and consequently it appears desirable that the term should be applied more widely. After careful consideration, I have decided to deal with the collection and presentation of statistics relating to—

- | | |
|---------------------|-----------------|
| (i.) Population. | (iv.) Sickness. |
| (ii.) Births. | (v.) Marriages. |
| (iii.) Vaccination. | (vi.) Deaths. |
| (vii.) Pauperism. | |

I do not submit that list as exhaustive, for there are many classes of statistics relating to things or matters which materially affect the national health. As an example, the prices of food stuffs may be mentioned; but I am not sufficiently acquainted with the details necessary for an inquiry of the magnitude which would be involved by extending the list beyond the subjects already mentioned.

There is one detail common to all the statistics selected for discussion which should, I think, receive separate consideration. I refer to the selection of the unit of area for collection and

registration of data. The extent to which the want of uniformity in this detail hampers the proper collation of statistics collected by the different offices, both national and local, will become evident when the several classes of statistics are considered.

Unit Area.—Like most of our institutions, the existing subdivisions have not been turned out as a machine-made system, but represent a development which has progressed more or less *pari passu* with the needs of the community. Such a development has the advantage of durability, but lacks uniformity, and too often ends by becoming so cumbersome that a radical reform is the only effective remedy.

“The whole of England and Wales has been divided at different times into
 “various administrative areas, with so little regard to previously existing
 “divisions that, at the present time, the serious overlappings of boundaries
 “render the work both of the Census Office and of the local officials, in
 “ascertaining the precise limits of the several divisions to be separately
 “distinguished in the Tables, laborious and extremely complicated.”¹

The above quotation refers to the statistics collected by the Registrar-General, while those selected for this communication are collected by officials connected not only with the General Register Office, but with the poor law, sanitary, and other services.

The oldest statistics, those of the Census and General Register Office, are (or were) based on the poor law areas. The reason of this is not far to seek, and is illustrative of the intimate association of ecclesiastical and civil functions in past times.

Prior to the dissolution of the monasteries there was no need of a poor law service, the religious houses serving more or less satisfactorily as hospitals and workhouses. It was not until the time of Elizabeth that the needs of the poor received State recognition. During her reign officers were appointed to collect and distribute the contributions of the parishioners. The appointment of such officers (overseers of the poor) was made in connection with the Church, and the collection or rate made by them was at first voluntary, the demand being, however, backed up by the terror of the Church. It is unnecessary to trace the development of the poor law service, which underwent a final crystallisation in 1834, when an Act of Parliament (4 & 5 Will. IV, c. 75)—

“Established Boards of Guardians and 585 Poor Law Unions, which were
 “constituted of convenient numbers of parishes, while in 20 cases a
 “single parish had its own Board of Guardians. In the creation of
 “Poor Law Unions, more regard was had to the convenience of residents
 “and the conservation of existing parishes than to the boundaries of

¹ General Report of the Census, 1901, p. 11.

“Counties, and thus it happens that many Unions are partly in two “Counties.”²—*i.e.*, Ancient Counties.

Each census taken prior to 1841 was entrusted to a Special Commissioner, and the results were collated for the then existing divisions of counties (geographical), hundreds, parishes, &c. When civil registration was instituted in 1837, the only local authorities, except in charter towns, were those of the poor law service. Naturally, therefore,

“The Poor Law Union was made the unit for Registration purposes, “the consequence being that many Administrative Districts and “Subdistricts are partly in two Counties, and that Registration “Counties, which are aggregates of Registration Districts (each of “which is either co-extensive with a Poor Law Union or Parish, “or contains two entire Unions or Parishes) differ from what “have been termed Ancient or Geographical Counties, and also from “the modern Administrative Counties. The Ancient Counties have, “moreover, themselves undergone changes, notably under the “provisions of the Act 7 and 8 Vict., c. 61.”²

The clerks to the guardians were given the option of being appointed the first superintendent registrars.

From the very beginning the subdivision of the country for the purposes of registration was out of harmony with the subdivisions made for other purposes. The confusion has been made worse by the creation of the sanitary areas and administrative counties.

By the Metropolis Management Act, 1855, the various vestries and district boards were called into existence, the boundaries of the districts under their control having but slight reference to those of registration districts. The London Government Act, 1899, substituted Metropolitan Borough Councils for the vestries and district boards, and effected great changes in the boundaries of the sanitary districts. The extent of the changes can be seen by a reference to the Table (No. 5) included in any of the Registrar-General's Weekly Returns for 1901. A good deal has been done, however, to remedy the confusion thus created.

In the provinces, local government districts and improvement areas were formed in the early years of the last century in different parts of the country under special legislation, and it was not until 1873 that the country, outside the Metropolis, was formally divided (by the Public Health Act, 1872) into urban and rural sanitary districts, the latter mainly coterminous with poor law areas, the former being, however, formed on quite other lines.

² General Report of the Census, 1901.

By the Local Government Act, 1888, the new administrative counties were created. Of the sixty-two counties then formed—

“Fifteen were identical with the ancient or Geographical Counties as then existing; in some few cases the Administrative County together with a County Borough, or with two or more County Boroughs, with which it was associated, was coextensive with the Ancient County; whilst in most cases there was more or less difference, chiefly on account of the provision that ‘where any urban sanitary district is situate partly within and partly without the boundary of such County, the district shall be deemed to be within the County which contains the largest portion of the population of the district, according to the Census of one thousand eight hundred and eighty-one.’ ”³

The want of co-ordination between the ancient or geographical and the new or administrative counties has been increased by the rearrangements of boundaries effected by the County Councils under the provisions of the Local Government Act, 1894, by which those councils are required—

“In accordance with Section 36, to institute inquiries and, where deemed expedient, to make application to the Local Government Board for the alteration of County boundaries, in order that, in the special words of the Act, ‘the whole of each parish, and, unless the county council for special reasons otherwise direct, the whole of each rural district, shall be within the same administrative area.’ ”⁴

There are therefore three classes of “counties”—the “Ancient” (geographical), which are of use for Parliamentary representation; the “Registration,” which are simply groups of registration districts, the latter being poor law unions or parishes; and the “New” (administrative), which are the most important of the series. As already stated, the boundaries of the three descriptions of counties are rarely, if ever, coterminous.

Next in order to the administrative counties come the urban and sanitary districts. At first there was some overlapping of the boundaries of these districts and those of administrative counties, but by the operation of the Local Government Acts of 1888 and 1894 this has been almost entirely removed—

“Every Urban District is now entirely within one Administrative County, and each Civil Parish, with few exceptions, within one Urban or Rural District, while in many cases all the areas constituting an Urban District have been consolidated into a single Civil Parish; but ten Rural Districts are still partly included in two Counties, and in nine instances Rural District Councils administer, for convenience, Civil

³ General Report of the Census, 1901.

⁴ *Ibid.*

“Parishes situated in a different Administrative County. There remains
 “only one Civil Parish which is contained partly in two Administrative
 “Counties, viz., Stanground, which is partly in Huntingdonshire and
 “partly in the Isle of Ely.”⁵

By the division into administrative counties, and the further subdivision into urban and rural sanitary districts, the whole country is mapped out into a complete series of areas, which (with the exceptions mentioned above) are distinct each from the other, the smaller area being entirely within the larger. These divisions are well known to the public, and there is a pretty constant intercommunication between the public and the officials of the various councils in the administration of sanitary and other laws and the payment of rates. There is ample justification, I think, for the claim of this division of the country to be accepted as the most important, and indeed the only serviceable basis for all statistical work. This was in part recognised by the Census Officials, who urged the need of making registration and administrative counties coterminous,⁶ but they do not appear to have endorsed the view that the registration district should be entirely replaced by the sanitary, although they admitted the necessity of the preparation of statistics for the latter areas.⁷ The main argument against the substitution appears to be the fact that the cost of registration falls on the poor rate.⁸

With submission, I venture to say that no officials make more use of the statistics prepared by the General Register Office than do those of the sanitary service. That they do not make more use

⁵ General Report of the Census, 1901.

⁶ “For the purposes of the Registration of Births, Deaths, and Marriages, and for those of the Census, the assimilation of Registration to Administrative Counties, which might be effected by means of the suggestion by the Commissioners of 1888, is most desirable, and it may well be hoped that these recommendations, or some similar measures, may be embodied in an Act, so that this end may be more expeditiously achieved than is practicable under the provisions of existing statutes.” *Ibid.*

⁷ “Beyond this, however, the importance of Urban and Rural Districts as the units of sanitary administration renders it scarcely short of a necessity that there should be a closer relation as regards area between these Districts and Registration Districts, in order to facilitate the preparation of detailed statistics of mortality such as are now given for Registration Districts in the Registrar-General’s Annual Reports for each Urban and Rural District.” *Ibid.*

⁸ “The cost of registration is now mainly borne by the Guardians of the Poor, and under these circumstances the area of the Registration District can practically be no other than that of the Poor Law Union, or of a combination of Poor Law Unions, which at present are identical in but few cases with Urban or Rural Districts.” *Ibid.*

of returns prepared by other government departments, &c., is largely due to the difficulty arising from want of uniformity in the areas used in the tabulations, and to the delay which takes place in the publication of such returns. The sanitary officials appear to be entitled to ask that the sanitary area shall be the "unit area" not only for the statistics of the General Register Office, but for all statistics in any way connected with health problems. As will appear later on, arguments can be adduced in favour of transferring the registration of births and deaths from the poor law to the sanitary authorities. That question cannot, however, be further dealt with at this stage, and will, in consequence, be resumed later on. I wish, however, before passing to the next topic, to emphasise the suggestion that the sanitary area ought to be the "unit area."

Population.—An adequate knowledge of the number of inhabitants may be described as the rock or foundation stone on which our statistics are built. Such information is primarily obtained from the census, the figures for intercensal years being computed by various methods, checked by the difference between the number of births and deaths. I do not propose to deal with the subject of census taking, except to advert to two points: one the need of more frequent enumerations—a point which I need not labour—and the other the need of simplification of the work of tabulation.

I have already referred to the multiplicity of areas which at present exist, and the following list, taken from the General Report of the last Census (p. 14), is sufficiently convincing without further words from me:—

54 Ancient Counties.	500 County Court Districts.
468 Parliamentary Areas.	28 Metropolitan Boroughs with their Wards.
2 Ecclesiastical Provinces.	1,122 Urban Districts ^a with their Wards
35 " Dioceses (including Sodor and Man).	664 Rural Districts.
14,080 Ecclesiastical Parishes.	14,900 Civil Parishes.
63 Administrative Counties (including the Isles of Scilly).	11 Registration Divisions.
67 County Boroughs.	55 " Counties.
734 Petty Sessional Divisions.	635 " Districts.
54 County Court Circuits.	2,064 " Subdistricts.

Any reform which will shorten that list would result in speedier publication of the results, and I venture to think some greater security against inaccuracy.

In calculating estimates of the population, the balance of migration requires to be considered as well as the natural increment. In

^a Including 316 County or Municipal Boroughs.

the General Report of the Census (p. 16) it is stated that the "Board of Trade Returns do not yet afford the means of accurately "determining the number of migrants, either as emigrants or "immigrants," and more particularly as regards immigrants: a very important item.

Passenger lists have to be rendered by the masters of vessels carrying steerage passengers to or from non-European ports, all ports on the Mediterranean being regarded as European. The lists of out-going passengers are to be delivered to the Customs officer when applying for clearance papers, those of in-coming within twenty-four hours of arrival in port.

As regards outward bound ships, the name, age, sex, status as to marriage, and occupation of each passenger, steerage and cabin, are to be given, together with his nationality, and ports of embarkation and debarkation. In the case of ships arriving at home ports, the particulars are limited to name, age, and calling of every steerage passenger only, and the port of embarkation.¹⁰

It will be noticed that in the case of immigrants the particulars are scanty and deficient in important details. The differences between the two lists are here set out:—

Particulars Demanded.

EMIGRATION (cabin and steerage).	IMMIGRATION (steerage only).
Name.	Name.
Sex.	_____
"Occupation."	"Calling."
Nationality.	_____
Age.	Age.
Married or single.	_____
Port of embarkation.	_____
„ debarkation.	Port of debarkation.

"In practice the information actually contained in the "passengers' lists' is fuller than the law directly requires, and "there is no reason to doubt that the statements on which the "tables are founded give virtually a complete account of emigration and immigration to and from countries out of Europe, ports "within the Mediterranean being, as before stated, excluded"¹¹—an opinion not endorsed by the Officials of the Census Office.

There is no obligation to supply any returns of passengers travelling on ships plying between this country and European ports,

¹⁰ The legal provisions relating to these lists are to be found in Sections 311 and 336 of the Merchant Shipping Act, 1894.

¹¹ "Statistical Tables relating to Emigration and Immigration from and into the United Kingdom in the year 1903." Appendix, p. 17.

but returns are obtained "of the total number of passengers carried "in each direction within the preceding twelve months" from the various English railway and shipping companies, and (through the Foreign Office) from the Belgian Government (passengers carried by the State mail packets).

Information as to alien immigration is furnished under the provisions of 5 Will. IV, c. 11, the particulars required being "name, rank, occupation and description" of each passenger. The Act was not strictly enforced before 1888, and even now at certain ports the lists are incomplete.¹²

It is evident from a perusal of the Return of the Board of Trade that without the information supplied voluntarily by the railway and shipping companies the returns would be very incomplete.

So many people leave the country for short trips of business or pleasure, that it would be impossible to insist on full returns such as are required on outward bound ships carrying emigrants being made by every ship master. Such returns should, however, be required from the master of every ship, whether steerage passengers be carried or not, leaving for, or arriving from any foreign port involving a voyage exceeding 24 hours. As regards shorter voyages, returns should be furnished stating the numbers of passengers carried on each trip, giving the sexes and ages (as "children," "adults") of the passengers, and distinguishing the classes of tickets. It would be useful to show the numbers travelling on return or tourist tickets, as there would be a presumption that such passengers might be neglected in balancing the returns at the end of the year.

Short-trip passenger returns are, however, of much less importance than those relating to deep-sea travellers. It is desirable that returns, on the lines of those for outward bound emigrant ships, should be required from the masters of all ships carrying such passengers. The ages, judging by the tables included in the returns, require to be given with more precision.

Births.—Under the Act of 1836 (6 and 7 Will. IV, c. 86) the registration of births was entirely voluntary. Compulsory registration was first introduced by the Act of 1874 (37 and 38 Vic., c. 88). The principal provisions of that Act with regard to the registration of births are here set out:—

"In the case of every child born alive . . . it shall be the duty of the
 "father and mother of the child, and in default of the father and
 "mother, of the occupier of the house in which to his knowledge the
 "child is born, and of each person present at the birth, and of the

¹² "Statistical Tables relating to Emigration and Immigration from and into "the United Kingdom in the year 1903." Appendix, p. 17.

“person having charge of the child, to give to the Registrar, within
 “forty-two days next after such birth, information of the particulars
 “required to be registered concerning such birth . . .” (Sec. 1.)

The putative father of an illegitimate child is not required to furnish particulars of the birth of such child, and his name is not to be entered in the Register except at his request. (Sec. 7.)

After 42 days the Registrar may require attendance at his office of any of the persons mentioned in Sec. 1 for the purpose of registering the birth. (Sec. 2.)

Any one finding a new-born child, or having charge of such child, is to furnish such particulars as are available to the Registrar within seven days. (Sec. 3.)

Registrar is to keep himself informed of the occurrence of births. (Sec. 4.)

Sec. 5 provides for the special registration of a birth after from three to twelve months.

Under Secs. 39 and 40 of the Act, various penalties are prescribed for offences against the Act, among which is included failure on the part of the parent to give information of the birth of a child.

The interval allowed for registration (six weeks) appears to me to be too long. Registration of the death of the child only too frequently precedes that of its birth.¹³

The returns of births published represent the numbers registered in the various districts, and no attempt has hitherto been made to allot births in institutions to the districts in which the parents reside. Hence the official rates of infantile mortality for certain areas do not represent the true mortality. As an example, I may mention the rate for Marylebone. According to the Annual Summary, the rate for 1903 was 96 per 1,000 births, one of the lowest rates in the metropolis.¹⁴ The Medical Officer of Health of the Borough, by eliminating the births in Queen Charlotte's Hospital, which did not belong to the borough, obtained a rate of 142. In some of the poorer districts the lack of such correction tends to put the rate unduly high. Taking the country as a whole, of course, no such errors occur, but they may be considerable in smaller areas.

A further defect in the present system is the absence of any record of still - births. Lawyers have not yet decided what constitutes “live birth,” so that there may be some difficulty in securing the registration of still-births: but that difficulty should not be insuperable.

¹³ Of 388 deaths of infants registered in Paddington during 1903, 124 (= 32 per cent. nearly) occurred at ages under one month.

¹⁴ “Annual Summary, 1903,” Table 20, p. 61.

Weekly returns of the numbers of births registered are forwarded to Somerset House from certain districts, and copies of the entries once a quarter from all districts. Except to distinguish legitimate from illegitimate births, no use of these returns appears to be made. Information is much wanted of births distributed according to occupation of the parents, both to ascertain in what ranks of life the prevailing decline in birth-rate is occurring, and to point out (what is probably, however, easily guessed) in what ranks of life the greatest sacrifice of infants takes place.

The first suggestion I have to make is towards securing earlier information of the occurrence of a birth.

It will be well to state briefly the arguments in favour of such a proposal. We are at the present time faced by the facts of a steadily decreasing birth-rate, of an infantile mortality almost as high as in pre-sanitation times, and of much ignorance in the care of young children.¹⁵ For the first I fear no remedy can be suggested but something can be done to counteract the ill effects of the others. The proper remedy is the teaching of domestic hygiene, including the care of children, in the public elementary schools. Owing to compulsory school attendance and early employment of young girls, the future mothers lose the advantage of that training which they formerly obtained by having the care of younger members of the family. Such remedy, however, cannot become operative for some time to come, and during the intervening years the local authorities must be relied upon to supply the deficiencies already referred to. Health visitors and women sanitary inspectors are doing much good work in this direction, but to be effective their visitations and advice must be available in the first weeks of the child's life, the most critical period of its existence.¹⁶ Local authorities rely upon the registration returns¹⁶ for the information which is to set their officials in motion. The registration ought therefore to be effected within the shortest possible period after birth.

With that end in view, I suggest the application of the system of notification by the medical practitioner (when one is in attendance), or by the midwife (there is almost always one present where no doctor is called in), and by the head of the family, the dual responsibility to be strictly enforced. The midwife has secured State recognition, and may fairly be called upon to give this information.

¹⁵ The Committee on Physical Deterioration strongly urge the general adoption of such work. See Pars. 297—302 and Rec. 33, pp. 58 and 89.

¹⁶ It is only within the last few months that the Registrar-General has officially sanctioned returns of location of births being sent to the local authorities. (See circular letter of 31st October last.)

I should like to see every birth “notified” within four and twenty hours of its occurrence, and the “registration” by the parent or other responsible person effected within the week.

The “notification” should be addressed to the medical officer of health, and, if registration is still to be the work of the poor law officers, he should forward copy of such notification to the registrar, who would then be in a position to secure the registration.

Notification and registration should apply to still-births taking place at or after the seventh month of gestation.¹⁷

The notification of a birth in an institution would be forwarded to the medical officer of health of the district from which the mother was admitted, and thus a proper allocation of births to the districts of parents’ homes would be effected and the infantile mortalities be more accurately recorded.

It is possible that notification might ultimately be found an efficient substitute for registration as now practised. I venture to think that it would be an exceedingly rare occurrence for a birth to take place and not get to the knowledge of the local officials. Anonymous communications would be received where concealment was attempted. I am not, however, prepared to suggest the abandonment of the present system of registration, but desire to see it preceded by notification and effected within a much shorter period by the sanitary authorities.

Vaccination.—Vaccination is so essentially a matter of preventive medicine, that it is difficult to understand why the administration of the Vaccination Acts is still in the hands of the Poor Law Authorities. The present occasion is not a suitable one for putting forward arguments in favour of the transference of this duty to the sanitary authorities, and it must suffice to indicate the defects in the present system of presenting statistics of the administration.

The use of poor law areas in lieu of sanitary stands in the forefront. The second defect is the delay in issuing the returns. The last Annual Report of the Local Government Board, that for 1903-04, contains the returns relating to children born during 1901. The statistics are not given in their entirety in that Report, part of them being contained in the Supplementary Report issued by the Medical Officer of the Board.

I have already spoken of the desirability of altering the areas for tabulating the returns, and will confine myself to the questions of form of the returns, and to the delay which attends their publication.

¹⁷ This is the limit suggested by the Select Committee on Death Certification which sat in 1893.

As regards the form of the returns, attention may be called to the fact that there is no indication of the amount of protection afforded by the vaccinations recorded as "successful." This is due to the absence of any standard of vaccination in the prescribed certificate, but some of the ambiguity would be removed if the number of insertions were given.

At present the returns are made up half-yearly by the vaccination officers, and deal with the vaccinations of children born during the half-year. As six months are allowed to elapse before vaccination becomes compulsory (to the extent allowed by the conscientious objector's clause), the final returns for any given year cannot be made up until six or more months after the close of the year. It is undoubtedly advantageous to be able to say that of the children born during the year (say) 1901 so many were "vaccinated," &c., but as no account of the state of vaccination is included in the death certificate, except after small-pox, that particular system of record loses much of its value, and fails to give more than the merest approximation to the proportion of the population protected (more or less) by vaccination.

It would be possible to secure earlier returns relating to the operation of the vaccination laws without disturbing the present form of returns. Returns might be prepared at the close of each year showing the number of vaccinations, re-vaccinations, &c., performed during the year, distinguishing the sexes and ages of the persons operated on. By splitting the ages under 1 year into groups of (say) 0—, 3—, 6—, and 9— months, a very fair idea would be obtained of the proportion of children escaping vaccination. After all, that is the most important information. Such form of return would give adequate information about re-vaccination, a point on which the present tables are not instructive.

Marriages.—I do not propose to say anything about the law regulating the solemnisation of marriages. Registration of the ceremonies performed is effected by the following:—

Ministers of the Church of England;

Rabbis of the Jewish faith;

Ministers of the Society of Friends;

"Authorised persons" in pursuance of the Marriage Act, 1898; and

Registrars.

The last may act either because the marriage takes place in his presence in a chapel or other building not licensed for the solemnisation of marriages, or because he himself performs the civil marriage in his office. Looking at the subject simply as a matter of civil registration, one cannot but be struck with the simplicity of

the French law, which requires the civil contract of every marriage to be performed at the *Mairie*, and leaves the contracting parties quite free as to the performance of the religious ceremony.

The present system, so far as I can ascertain, is cumbersome, but effective, and short of requiring a civil ceremony in every case, as is done in France, I doubt whether any better statistical results can be obtained.

Sickness.—Statistics relating to sickness can be obtained from several sources, some compiled by public officials, others by persons occupying private—or at all events non-official—positions. The diseases included in these various returns require to be divided into two categories, (*a*) the principal infectious diseases, and (*b*) all other diseases.

The sources of information are the notification returns of the infectious diseases,¹⁸ the records kept by the poor law medical officers both of in-door and out-door cases, and the registers of the many hospitals and benefit societies. The list may not be a complete one, but will serve to show the great and valuable mass of information which is available.

Of the above sources those derived by notification and the poor law service have been instituted by law, either by Act of Parliament (notification) or by Orders of the Local Government Board (poor law). The latter being of prior institution, may be dealt with first.

Records of pauper sickness have been kept for many years. There are in my office extracts from the poor law medical officers' books relating to cases coming under treatment, dating back to the first appointment of a medical officer of health in 1856. Up to the introduction of notification this source of information was freely drawn upon by the medical officers of health. In 1879 the Local Government Board issued an Order requiring poor law medical officers to furnish medical officers of health with information relating to all cases of infectious disease and to such cases of other disease "as the Board by subsequent Order directs."¹⁹ The provisions of the Order of 1879 still remain in force, although very rarely used.

I have been surprised to learn that no returns of cases treated as out- or in-relief are required by the Local Government. Moreover, there appears to be no obligation on the medical superintendents of the workhouse infirmaries to keep any notes of cases under their

¹⁸ The infectious diseases scheduled for notification are small-pox, cholera, diphtheria and membranous croup, erysipelas, and the fevers known as scarlet, enteric, typhus, simple continued, and puerperal.

¹⁹ Order of 12th February, 1879, Sec. 3. Memorandum of 28th July, 1885.

care. In 1900 an Order²⁰ was issued by the Board requiring quarterly returns of cases of certain diseases occurring in the "Children's Receiving Homes." A specimen of the form drafted for this return will be found at the end of this paper (Appendix A).

Notification of infectious diseases received legal sanction by the Act of 1889, which made the system compulsory in the Metropolis, but adoptive in the rest of the country. Voluntary notification had been in vogue both in the Metropolis and in certain provincial towns, for some years previous to 1889. Huddersfield was the first town to obtain an Act for enforcing the practice. The provisions of the Act of 1889 were repealed, so far as the Metropolis was concerned, by the Public Health (London) Act, 1891, and the power of adoption in the provinces abrogated by the Infectious Diseases Notification (Extension) Act, 1899, which made the notification of the diseases mentioned in the principal Act compulsory throughout the country. In both cases there is, however, power to add other diseases to the schedule. Among the diseases to which notification has been from time to time extended may be mentioned plague, chicken-pox, measles and whooping cough, and mumps. Sheffield has recently obtained a special Act making the notification of phthisis compulsory for a period of five years from 1903.

Although the data obtained by notification suffer from certain defects, errors of diagnosis being the most important, yet the accumulated statistics should furnish most useful lessons in epidemiology. Here again, however, there has been no real attempt to extract the maximum utility from the statistics. It is true that the metropolitan returns have been since 1889 regularly forwarded to the Metropolitan Asylums Board, and published in the Annual Reports of that Board and in those of the Local Government Board.

As regards the provinces, Dr. Tatham, then Medical Officer of Health of Manchester, and now Medical Superintendent of Statistics, inaugurated in 1888 a system to make the information obtained by voluntary notification generally available. Weekly returns of notification were transmitted to him by the medical officers of health of 33 provincial towns, were tabulated by him, and circulated among the officers forwarding the returns. In 1889 the work was taken over by the Local Government Board, and the number of districts making the returns has steadily increased. At the present time the Board's weekly statement includes returns from 255 provincial boroughs and urban districts, having a total population at the last census of 14,861,491 persons. The metropolitan figures are also

²⁰ Order of 19th March, 1900.

included, so that the statement gives the number of cases reported each week among 19,397,920 persons, rather less than half the population of England and Wales. Returns of cases reported on ships are also published from 55 port sanitary districts. The information is, however, supplied voluntarily.

The returns are summarised each year in the Annual Report of the Board, the last annual tables being those for 1903. Each medical officer of health includes in his annual reports particulars of the cases reported in his district. There has been, however, no compilation of returns covering the whole country, nothing to show the varying prevalence of infectious disease in the different districts, and no guide as to average or exceptional incidence in different years. Much may be learned by anyone having leisure to collect and examine the reports of the medical officers of health, some of which, however, are not printed; but although nearly every officer (if not every one) sends a copy of his annual report to the Local Government Board,²¹ no compilation or critical examination of the reports has hitherto been published.²² Quite recently statistics from some towns have been obtained (voluntarily again) by the Registrar-General, and included in his Quarterly Reports.

Of the statistics collected by hospitals, dispensaries and benefit societies I can say little, beyond lamenting that no systematic attempt has hitherto been made to compile a national register of sickness and accidents. The waste of valuable material, compiled with much labour and at considerable cost, is deplorable. Occasional compilation by independent inquirers, valuable as such work is, cannot replace systematic continuous record. It will cost money to keep such records, but I feel sure that it will be money well spent, and in the end productive of economy, if the lessons deducible from the statistics be put into practice.

The suggestions I have to make in connection with this part of my subject are: first, the unification of areas for poor law and sanitary purposes, as has already been indicated; second, the compilation of periodical returns of notification from all parts of the country. The office entrusted with this duty should have power to require the returns to be sent in regularly, and the full tables should be promptly issued to all medical officers of health. It does not seem desirable that such returns should be sent in less frequently than once a week. It has been suggested that the medical officers of each administrative county should be responsible

²¹ During 1903 the Board received Annual Reports relating to 1902 from 691 rural medical officers of health, 1,116 urban, 59 port, 31 metropolitan, and 6 others not appointed subject to the approval of the Board.

²² The reports of the public analysts receive more attention!

for the preparation and distribution of such summary tables. Apart from the consideration that few counties have officers devoting their whole time to their duties, I think that returns relating to the whole country would prove more generally useful. I should therefore prefer to see the work continued by the Local Government Board.²³ A complete summary of the notification returns, giving particulars of sex, age, &c., should be included in the Board's Annual Report. The data for the latter are already available, as may be seen from the table (Appendix B) which the Board requires every medical officer of health to include in his annual report.

Returns of cases of diseases, other than the infectious diseases which are notified, coming under the care of the medical superintendents of workhouse infirmaries and poor law medical officers, should be included in the annual reports of all medical officers of health. The knowledge that no use is ever made of the information, not unnaturally tends to some slackness in the keeping up of the registers, but I think I may safely say that when the poor law medical officers find that a real value attaches to their registers, such officers will not be found wanting in efforts to make their registers complete and instructive. Summary tables for the whole country should also be compiled.

As regards hospitals and benefit societies, reliance must be placed mainly on voluntary co-operation. The Committee of His Majesty's "Hospital Fund" could render much assistance towards obtaining proper returns from the hospitals if such assistance were found necessary.

Deaths.—Registration of death implies two acts—the registration of the act of dying, and that of the cause of death. The mode of registration, &c., is prescribed by the Act of 1874 (37 and 38 Vic., c. 88), the principal provisions of which are here briefly summarised:—

The particulars necessary for the registration are to be furnished

(a.) In the case of a person dying in a house²⁴ within five days of the death by

“the nearest relatives of the deceased present at the death or
“in attendance during the last illness of the deceased”; or

“every other relative of the deceased dwelling or being in the
“same district as the deceased”; or

“each person present at the death”; or

²³ A resolution in favour of such complete weekly returns was adopted by the Conference on “Vagrancy and the Spread of Infectious Diseases,” held at Spring Gardens in November last.

²⁴ “House” includes a “public institution,” which latter term includes prisons, workhouses, lunatic asylums, hospitals, and “any prescribed public or charitable institution.”

“the occupier of the house in which, to his knowledge, the
 “death took place”; or
 “each inmate of such house”; or
 “the person causing the body of the deceased to be buried.”
 (Sec. 10.)

- (b.) In the case of a person not dying in a house, or of the finding of a dead body, within five days of such death or finding by
 “every relative of such deceased person having knowledge of
 “any of the particulars required”; or
 “every person present at the death” or “finding the body”; or
 “any person taking charge of the body”; or
 “the person causing the body to be buried.” (Sec. 11.)

The only person liable to a penalty for failing to give the required information is the person on whom the first liability falls. Those liable in default of others incur no penalty if they neglect to furnish the information.

Every medical practitioner attending the deceased in his last illness is to furnish a certificate of the cause of death, the certificate to be given to some person liable for the registration of the death (*see above*), who is to deliver the certificate to the Registrar when furnishing the required particulars of the deceased and his death. (Sec. 20.)

There is no provision relating to deaths in respect of which no medical certificate is forthcoming. In practice such deaths are referred by the registrar to the coroner for inquiries. Certified deaths in which any suspicions of foul means, violence, &c., arise are also reported to the coroner by the registrar.

If written notice of the death and the certificate of cause of death be sent to the Registrar, fourteen days are allowed, instead of five, for the formal registration of the death. (Sec. 12.)

If a death remains unregistered fourteen days the Registrar, if he has knowledge of such death, may require the attendance at his office for the purpose of registering such death, of any person liable to supply the requisite particulars. (Sec. 13.)

At the time of registration, or on receipt of the notice and certificate, the Registrar is to issue an Order for Burial,²⁵ which Order is to be handed to the person performing the funeral service. Burial may take place without such Order, but in that case the person performing the ceremony is to give the Registrar notice of the occurrence within seven days. (Sec. 17.)

A coffin is supposed to contain only one body. If more are enclosed, certain particulars are to be furnished to the person who buries the bodies. (Sec. 19.)

Sections 39 and 40 provide a long list of penalties for various offences but, as already stated, only one person is liable to a penalty for failing to register a death.

²⁵ The coroner can give a similar order before sending his certificate of cause of death to the registrar. (Sec. 17.)

When examined critically the supposed compulsory registration of deaths is found to be so in a very indirect manner only. The present system of certification and registration of death is generally regarded as affording a satisfactory safeguard against crime or fraud, and productive of excellent data for statistical purposes. The system undoubtedly works much better than the legal provisions would lead one to anticipate, and it is unlikely that many deaths escape registration, while instances of fraud are happily rare—so far at least as our knowledge goes. The success attained has, however, been due rather to good citizenship than successful legislation. The Select Committee on Death Certification²⁶ appears to have arrived at the same conclusion. I shall refer to the Committee's Report in connection with the suggestions which I have put before you.

My first criticism is directed against the long list of persons liable for registration, and the inadequate provision to fix the liability on any one of them. Each person enumerated is to act in default of the other, and the person really liable for the registration is the "indeterminate he" included in the first category. All the others would be excused on the plea that they did not know registration had not been effected, and it would be difficult to bring the liability home to the "indeterminate he."

The certification of the cause of death appears the most defective part of the present system, and at the same time to offer the simplest means of improving it. Not only can the practitioner refuse (subject to liability to penalty under Sec. 39 of the Act of 1874) to give a certificate, but if he gives one he need not use the form issued by the Registrar-General, and he has to hand it to the person (the "indeterminate" he) responsible for the registration of the death. Further, there is nothing to prevent a medical man from certifying the cause of death of a person who has not been under his care for a long time, and the certificate may be given without actual knowledge that the deceased is dead. Where no medical man has attended the deceased in his last illness, the cause of death may or may not be adequately determined. The registrar reports such a death to the coroner, who either himself (very rarely) or by his officer (usually) makes inquiries as to the circumstances of the death. The officer is generally a police constable (active or retired), and cannot be supposed to have the medical knowledge necessary for such an inquiry. The coroner

²⁶ See Report from the Select Committee on Death Certification, 1893.

may order an inquest to be held, or direct the death to be registered without a certificate, or on the information given by the medical practitioner who had attended the deceased at some time, and had some idea as to what would be the probable cause of death. The unsatisfactory manner in which the cause of death may be certified is fully dealt with in the Report on Certification already referred to. Although not submitting the recommendations of that Committee as suggestions for amending the present system, I place before you such of them as deal with the defects to which attention has been directed, as they indirectly support the proposals which I am about to make.

THE SELECT COMMITTEE ON DEATH CERTIFICATION. 1893.

Summary of Principal Recommendations.

- (1.) That in no case should a death be registered without production of a certificate of the cause of death, signed by a registered medical practitioner, or by a coroner after inquest, or, in Scotland, by a Procurator Fiscal.
- (2.) That in each sanitary district a registered medical practitioner should be appointed as public medical certifier of the cause of death in cases in which a certificate from a medical practitioner is not forthcoming.
- (3.) That a medical practitioner in attendance should be required before giving a certificate of death to personally inspect the body; but if, on the ground of distance, or for other sufficient reason, he is unable to make this inspection himself, he should obtain and attach to the certificate of the cause of death a certificate signed by two persons, neighbours of the deceased, verifying the fact of death.
- (4.) That medical practitioners should be required to send certificates of death to the registrar, instead of handing them to the representatives of the deceased.
- (5.) That a form of certificate of death should be prescribed, and that, in giving a certificate, medical practitioners should be required to use such form.

The remedy which I have to suggest is the adoption of the principle of notification, that is "certification" by the medical practitioner and "notification" by the head of the family or household, with or without (preferably with) the transference of registration to the sanitary authorities.

The dual principle should be strictly enforced, so as to secure notification of the death by the family or other person where no medical practitioner was in attendance. Where a medical practitioner has attended the deceased in his last illness, he should forthwith certify the death and the cause thereof to the medical officer of health of the district, using a prescribed form, in which should be embodied the certificate suggested in recommendation (3)

above. Such procedure is also on the principles of recommendations (4) and (5).

The medical officer of health would determine whether the cause of death was so stated as to make it clear what was the immediate as distinguished from the remote cause of the fatal issue; and, if the system of verification were also adopted, and he were the "verifier," would take immediate steps to verify the death, and to secure the particulars required for registration. The Committee on Physical Deterioration suggested that the cause of death should not be entered in the register.²⁷ Such omission would, I think, be a grievous mistake; but it appears to me that the entry might be made after, and not before, the informant signs the register. His signature binds him only to the statements which he has made, and under the system here proposed he would have no knowledge of the contents of the certificate of cause of death.

Where the death was not certified by a medical practitioner as suggested above, the "notification" by the head of the family would put the machinery of registration in motion. The medical officer of health would make preliminary inquiries in conjunction with the coroner, and the procedure would follow on the present lines. It should be obligatory to have medical evidence at every inquest, and the omission of the *post mortem* examination should be of very exceptional occurrence.

As regards the order for burial, the recommendation of the Committee on Death Certification cannot, I think, be improved upon—

- (6) "That it should be made a penal offence to bury or otherwise dispose of a body except in time of epidemic, without an order from the Registrar stating the place and mode of disposal, which order, after it has been acted upon, should be returned to the Registrar who issued it."

If the medical officer of health were the registrar, the exception relating to time of epidemic would be unnecessary.

Only one body should be allowed to be enclosed in any coffin, except special permission to the contrary be given in the burial order.

The registration of children born dead would naturally follow the registration of still-births. Here again the recommendation of the Committee already referred to appears to be sufficient, subject, however, to such modifications in procedure as are consequential on the system now suggested—

²⁷ "Report, Inter-Departmental Committee on Physical Deterioration (1904)," vol. i, p. 78, par. 391.

- (9) "That still-births which have reached the stage of development of seven months should be registered upon the certificate of a registered medical practitioner, and that it should not be permitted to bury or otherwise dispose of the still-birth until an order has been issued by the registrar."

The medical officer of health would forward copies of the entries in the register to the Registrar-General as is now done by the registrars, with the added advantage that the entries as to the cause of death may be expected to be perfectly intelligible and suitable for tabulation. Such a scheme would, I think, ensure greater harmony between the local tables of causes of death and those of the Registrar-General. It is also conceivable that the knowledge that the certificates would be subjected to scrutiny by a medical man, would ensure greater care being taken to make the certificates adequate records of the causes of death.

Pauperism.—It is unnecessary to say anything on the prejudicial influences on public health exercised by poverty. The subject is one of very great import to those concerned with problems in vital statistics. Roughly speaking, three-quarter million inhabitants of England and Wales receive relief in various forms from the Poor Law Authorities. In addition there are unknown numbers needing and receiving help from such agencies as the Churches, the Charity Organisation Society, &c. Of the latter I know of no returns. Of the poor law activities statistics are periodically returned to the Local Government Board. Unfortunately the published returns are not in a form to be of use to those concerned in public health work. An examination of the pages and tables contained in the Local Government Board's Annual Report will convince anyone that the information is of use only to those studying the annual variations in pauperism, not its connection with health.

The initial difficulty in connection with health problems is that of area, to which attention has already been drawn. In the second place the subdivision of persons receiving relief is almost exclusively limited to grouping under the heads of—

In-door	} relief	{ able-bodied not able-bodied	} adults.
Out-door			
			children under 16 years.
Vagrants.			
Lunatics in asylums.			

There are supplementary tables showing the distribution of persons receiving in-relief among the various institutions under the control of the guardians or otherwise. No distinction is made

between persons in the workhouses and infirmaries, nor is the number given of those receiving medical relief only. The absence of information as to the ages and occupations of those relieved is a serious defect,²⁸ but the worst is the fact that the numbers recorded do not state the actual number of persons receiving relief. The same person may appear in the records several times in the course of the year or half-year.

What is wanted is a general use of a card system, each card representing either an individual or a family, the former being the preferable. It would then be a simple matter to take out the actual number of persons relieved, to show their ages and occupations, and the frequency of application for relief. At the beginning of a new year the pack would contain the cards relating to those then in receipt of relief.

The care of lunatics rests with the guardians and the county councils, subject to a general supervision by the Commissioners in Lunacy. The returns of pauper lunatics contained in the Reports of the Local Government Board are of very little use in connection with health problems. They are for Poor Law Unions, whilst the more complete tabulation given by the Commissioners in their Reports are for administrative counties, with additional tables for unions and parishes. It seems desirable that this additional work should be made unnecessary.

An examination of the last Report of the Commissioners shows that there is no information as to the civil status of lunatics. Many of course have never had any occupation, but it appears to be desirable that there should be some indication of the ranks of life in which lunacy develops.

Presentation of Recorded Data.—Passing to the consideration of the presentation, or publication, of the statistical data which have been passed in view, one is struck with the number of reports which it is necessary to collate for a complete study of problems connected with public health. The reports are not only issued by the various authorities (national or local) independently of each other, but the tabulation of the statistics is only too frequently so different that collation is almost impracticable.

²⁸ The suggestion that such information is desirable has received unexpected confirmation. In a circular letter to the Boards of Guardians, dated 27th December last, the Local Government Board state that "they will be glad "if the guardians will be good enough to cause such arrangements to be made" as will furnish "information as to the age and usual occupation of persons . . . "and the immediate cause of their application . . . in respect of all fresh cases "in which relief is applied for and granted in each week of the ensuing quarter." —*The Times*, 30th December, 1904.

As evidence of the number of documents the following (admittedly incomplete) list is submitted:—

NATIONAL PUBLICATIONS.

Subjects.	Report Issued from	Frequency.
Population	Census Office	Decennial
<i>Em- } migration</i>	Board of Trade	{ Monthly
<i>Im- }</i>		{ Annual
Births	{ General Register Office	{ Weekly
Deaths		{ Quarterly
Marriages		{ Annual
Sickness—		
<i>Infectious diseases</i>	Local Government Board	Annual
<i>Other diseases</i>	None	—
Vaccination	Local Government Board	Annual
Pauperism	"	"
<i>Employment</i>	Board of Trade	{ Monthly
		{ Annual
<i>Lunacy</i>	{ Local Government Board,	{
	Commissioners in Lunacy	"

LOCAL PUBLICATIONS.

Reports by Medical Officers of Health.

„ Board of Guardians.

„ Managers and Officers of Lunatic Asylums.

Reports which should be complementary to each other fail to be so on account of the diverse areas selected for tabulation. Two examples may be cited, viz., the returns relating to the notification of infectious disease issued by the Local Government Board (collated for sanitary districts) and those for deaths from such disease issued by the General Register Office (collated for large registration areas only). Again, the lunacy returns of the Local Government Board are tabulated for poor law areas, those of the Lunacy Commissioners mainly for administrative counties, boroughs, &c.

As regards what are here described as “local publications,” no official collation of the data contained therein is ever published, although all the reports are annually transmitted to one or other of the Government departments, and in many cases forms are prescribed by such departments with a view to securing uniformity in the returns.

Of the “national publications,” those of the Census Commissioners and the Registrar-General are the only two entirely devoted to “vital statistics.” In other reports the statistics form but very small items, and the review of the statistics dealt with therein will indicate sufficiently the changes in form of presentation which appear to be desirable. The Census Report will be dealt with

incidentally only, and the criticisms about to be submitted will be confined to the Annual Report of the Registrar-General. Much of what I shall submit applies equally to the Quarterly Reports of that Officer.²⁹

Two annual reports were issued by the Registrar-General during last year, viz., those for 1901 and 1902.³⁰ The publication of the former was nearly two and a half years subsequent to the close of the year dealt with, and that of the latter just about one and a half years. Leaving the question of delay in issue for subsequent consideration, I shall select the 1902 report for my present purposes.

The report consists of—

(a.) Introductory letter by the Registrar-General.....	pp. v—xxxi
(b.) Analysis of Causes of Death by Dr. Tatham	pp. xxxii—lxxii
(c.) Meteorology of the Year	pp. lxxiii—lxxix
(d.) Tables (not limited to 1902 nor to England and Wales).....	pp. lxxx—clxxx
(e.) Results of Registration, 1902	pp. 2—267
(f.) Indices of Registration Districts and Sub- districts	pp. 268—301
Index of Urban Sanitary Districts	
Changes in Registration Districts and Sub- districts	
(g.) Index to Report	pp. 302—308
(h.) Abstract of Arrangements respecting Arrange- ments for Registration of Births, Deaths, and Marriages in British Dominions beyond the Seas	pp. 1—43

The part of the report which is really limited to the statistics of 1902 is—

“(e) Results of registration,” pp. 2—267.

The figures given therein are tabulated under the following head-lines:—

(I) Births, deaths and marriages during 1902:—

In registration divisions, counties, districts, and subdistricts.

As regards births and deaths the information given comprises:—

Births. Total numbers; numbers of legitimate and illegitimate.

Deaths. Total numbers; numbers of deceased males and females.

Marriages. Total numbers; mode of solemnisation; season; civil condition; age; signature by mark in register.

²⁹ The weekly and quarterly returns are prepared in a totally different manner to that adopted for the annual reports. The former have very little permanent value.

³⁰ The report for 1903 has not yet been issued.

- (II) Deaths in workhouses, hospitals, lunatic asylums, and idiot asylums :—
In registration divisions, counties, districts, and subdistricts.

The numbers of deaths (persons, males and females) in each separate institution throughout the country are given.

- (III) Deaths of persons, males and females, at different ages, in :—
Registration divisions and counties.
(IV) A. Causes of death at different periods of life in :—
England and Wales; and in
London (*i.e.*, Registration London).

Separate tables are given for males and females, and the causes of death are set out in accordance with the new schedule. The age-groups number 21, viz. :—

3 at ages under 1 year.	"All ages."
4 " 1—5 years.	"Total under 1 year."
4 " 5—25 "	" " 5 years."
7 " over 25 years.	

There are supplementary tables of "deaths certified as from "infective processes," deaths from tuberculosis, syphilis and lobar pneumonia being excluded therefrom.

- (IV) B. Causes of death in Registration Counties :—
Full schedule of causes of death for males and females of all ages.
(IV) c. Selected causes of death and inquest cases in :—
Registration divisions, counties and districts.

The causes of death included in the latter tables are (in addition to "all causes") :—

Small-pox.	Pulmonary Tuberculosis. }	Rheumatic Fever. }
Measles.	Tuberculous Phthisis. }	Rheumatism of the }
Scarlet Fever.	Phthisis not otherwise de-	Heart. }
Typhus "	fined.	
Influenza.	Tuberculous Meningitis.	Pneumonia.
Whooping Cough.	" Peritonitis.	Bronchitis.
Diphtheria.	Tubes Mesenteria.	
Pyrexia of uncertain	All other Tuberculous	Childbirth and Puer- }
origin.	diseases.	peral Septic Diseases. }
Enteric Fever.	Cancer.	Violence.
Diarrhœa and Dysen-		All other causes.
tery. }	Septic Diseases (not puer-	Inquests.
	peral).	

In registration divisions and counties the deaths of males and females are distinguished, but in the districts the deaths are for persons only. In all these tables the numbers are for "all ages" only.

(IV) D. Violent deaths.—England and Wales:—

Deaths from accidents and negligence at various periods of life ;
separate tables being given for males and females.

The subdivision by ages is only slightly less minute than that in the tables included in (IV A) [see above]. The accidents, &c., are first summarised under thirteen main heads, two having three subheads each, and then set out so minutely as to specify almost every kind of accident, &c., which can occur. The tables take up fourteen pages.

There follow tables relating to

England and Wales—Deaths from suicide at different periods of life :
separate tables being given for males and females.

Twelve age-groups are used, and eight main headings, followed by a very minute analysis of the means employed to attain the object in view.

The two last tables are—

England and Wales—Deaths from murder at different periods of life.

England and Wales—Deaths from manslaughter at different periods of life.

In these the deaths of males and females are given separately in each table under nineteen age-groups. The analysis of methods is not quite so elaborate as in the case of accidents and suicides.

I venture to think that the analysis given above reveals certain defects, and conveys a sense of deficiencies. All will appreciate the amount of labour expended in tabulating such a mass of statistics, and the care taken to ensure accuracy. What method has been used I do not know, but I will hazard the guess that no card system has been employed, the absence of which means much time wasted.

My first criticism is directed against the use of registration areas for the purpose of tabulation.

I need hardly remind you that the study of vital statistics is not one in which the various factors dealt with are alike in all respects. What one may term the environment of the data is different in each area, and satisfactory use of the statistics is possible only by either a full knowledge of the differences, and a judicious weighing of the same, or by a process of elimination of certain of the factors. For a knowledge of the principal factors making up the environment recourse must be had primarily to the census reports. It will be useful, therefore, to see what amount of information the census returns give as to registration districts.

Each "county" report contains 38 tables, a list of which will be

found in Appendix C. Of the 38 tables, only 11 refer to the registration areas. They are:—

Tables Nos. 1, 12, 15, 16, 17, 18, 22,³¹ 26, 29, and 30.

Tables Nos. 1 and 16 are the only two out of the eleven which are of any use in connection with the statistics of the annual report.

On the other hand, such important data as housing and occupation are tabulated for each administrative county, "housing" tables being also given for each sanitary district, both urban and rural, and "occupation" tables for the larger urban districts. That the Commissioners regarded the compilation of statistics for sanitary districts as the most important part of their work, is shown by the fact that no fewer than 20 tables are devoted to these areas, viz.:—

Tables Nos. 6, 8, 9, 10, 19, 20, 21, 23, 24, 25, 27, 28, 32, 33, 34, 35, 35A, 36, 37, and 38.

The foregoing facts constitute to my mind a strong argument in favour of replacing the registration areas by sanitary "areas"—I do not say "districts," for a reason which will be apparent hereafter.

There is another argument in favour of the change to which Mr. Welton drew attention in his "Note" on the report for 1901.³² The figures given for the smaller registration areas [districts and subdistricts, see above (I)] are so incomplete that the tabulation thereof is really of very little value, and we are reduced to using the figures for registration counties and divisions. In such large areas certain factors are in operation which militate against any useful conclusions, namely, the variations in the proportions of the sexes and in the age-constitution of the populations. Moreover, a registration county contains a number of centres of population presenting very different characteristics as regards "housing" and occupation. Of these important factors we have no information, as there are no "housing" and occupation tables for registration counties.

Under the present system of tabulation the numbers of deaths registered in each area are given without any corrections for deaths of non-residents in public institutions within the area, and of residents dying in institutions beyond the area. To use a commercial phrase, there is no "clearance" of deaths—except in the Metropolis, where a complete voluntary system is in operation, carried on by a member of the staff of the General-Registrar Office.³³ Death-rates calculated on the published numbers are

³¹ This table is not derived from the census schedules.

³² See *Journal of the Royal Statistical Society* for July last.

³³ A similar system on a more extended scale is also carried out by many medical officers of health.

therefore liable to errors, which in areas containing a large number of public institutions may be serious.

The particulars in which the report appears to me to be deficient are :—

(a.) As to estimates of populations, and as to sex-age composition thereof; and

(b.) As to sex-age distribution of causes of death.

As regards population, the only information given is that contained in a table appended to the introductory letters (see Table 1, pp. lxxx and lxxxi), where the estimated population of England and Wales for each year is given, showing, however, only the numbers of males and females of all ages. It is true that the required information can be computed from the census reports, but for the sake of uniformity, if on no other ground, it is desirable that the results of the calculations made in the Register Office should be published.

There are only two tables in the report giving any sex-age distribution of the causes of death, viz., one for England and Wales (pp. 136—153) and one for (Registration) London (pp. 154—171). In all other cases the deaths, where distributed according to causes, are simply given for all ages, and often for persons only. The fatality and mortality of each disease both vary so greatly at different ages of life that information as to the ages of the deceased persons should form an integral part of the report. The same remark applies to the sexes.

Coming to the suggestions which I have to submit for your consideration, I have to speak first of the question of the area to be used for tabulation. Sufficient has already been said of the need of making the registration areas coterminous with the sanitary districts. There remains therefore the consideration of the class of sanitary area which would be most convenient for tabulation, and at the same time afford most useful statistics.

There are altogether 1,786 sanitary districts, viz., 316 county or municipal boroughs, 806 urban districts, and 664 rural.³⁴ It would be impracticable to publish returns for such a large number of areas, and as many of them contain very small populations, the statistics obtained would in those cases be of very little value. It appears to me that the administrative counties (there are 63 such counties, including the Isles of Scilly) should be the principal areas for tabulation. Such areas, however, would be subject to the same errors from their size and the varying sex-age, housing and occupational factors, as the registration counties, and I

³⁴ “ Final Report of the Census ” (1901) p. 14. See also p. 7, *ante*.

desire therefore to make the further suggestion that under each county there should be tables for each of the urban districts containing populations exceeding 20,000 persons. Counting the Metropolis as one district, there were at the last census 216 such districts,³⁵ viz. :—

1	having a population exceeding	700,000
8	having populations ranging from	250,000—700,000
24	„	100,000—250,000
42	„	50,000—100,000
141	„	20,000—50,000

The scheme suggested would give (in addition to the tables for England and Wales) a series of tables as follows :—

Administrative County of

Urban districts within such County

Rest of County of

and would involve the preparation of 369 separate tables, viz. :—

63 “Administrative County of.....”

29 Metropolitan Cities and Boroughs

215 Provincial Sanitary Districts

62 “Rest of County of.....”

I do not suggest the tabulation of the causes of death on the lengthy schedule used for the whole country except for entire counties. I think it would be sufficient if a shorter schedule were used for the urban districts, either that of the International Commission on the Nomenclature of the Causes of Death (Bertillon's Classification), or that of the Incorporated Society of Medical Officers of Health (Schedule B), the latter being founded on, and only differing slightly from, the former. The causes should be distributed according to sex and a limited age-grouping (seven groups only). Each table should contain certain other particulars as to area, population, births, &c. A specimen table on the lines here suggested will be found in Appendix D. The numbers of deaths entered in these tables should be corrected as far as possible for deaths of non-residents dying in institutions within the county or urban district, and for those of residents dying in institutions without it.

I have but one more suggestion to make before summing up. It is on the time which elapses before the report can be got out. Before dealing with this point it is but fair to note the large number of figures which have to be checked and tabulated, and the complexity of the tabulation. During 1902, 261,750

³⁵ *Loc. cit.*, p. 26. The 216 districts contained a total population of 18,941,780 persons at the last census.

marriages, 940,509 births, and 535,538 deaths were registered. These figures had to be grouped more or less in detail for 2,064 subdistricts, 635 districts, 55 counties, and 11 divisions—registration areas in each case. I do not desire to say anything which can be construed as a reflection on the very able Staff of the Register Office, but must express my regret that delay has been and apparently continues to be inevitable under the present system, and endeavour to submit suggestions which appear to me to offer some prospects of hastening publication.

I would direct attention to the analysis of the last report already submitted. As I hold that the first function of the report is to present the statistics of the year's registration, I regard those portions of the report which are contained between pages 2 and 267 as the report of the year's working. In saying this I have no desire to depreciate the value of the other parts of the report, I only wish to point out that in my opinion the part specially referred to occupies a position different from the rest. It has occurred to me, therefore, that the report might with advantage be presented in two parts, one containing the returns of the year's registration, the other all the other matters now included in the report. Such division should ensure the publication of the year's figures at a much earlier date.

It also appears to me that the tabulation suggested according to administrative counties and large urban districts (involving 369 groupings, as against over 2,000) would hasten publication. Again, if medical officers of health were made the registrars of births and deaths, their co-operation might be obtained in the preparation of the tables for the individual districts. At present the local statistics prepared by those officers rarely agree with those of the Registrar-General, when the two sets of returns can be compared.

Finally, cannot some system of mechanical tabulation be employed? I hope something may be said of the methods at present in vogue in the Office, but as far as I am aware the calling over and "ticking" system is still in use. I have had upwards of fourteen years' experience of the use of cards in the preparation of statistics—I believe I was the first medical officer of health to adopt the system (in 1892)—and I have found them of the greatest service. The use of cards for births and deaths would mean a pack of nearly 1,500,000 cards, but if prepared and sorted as the returns are received, *i.e.*, quarterly, I do not think that number should appal a department whose whole time is (theoretically at least) given to the tabulation of statistics. By numbering each administrative county, sanitary district, cause of death, occupation, &c., six figures

and one or two strokes of the pen completes a "death card," while a "birth card" requires even less work. To make this part of my subject clear, I submit two blank cards of the type suggested. (See Appendix E.) The diagrams represent the actual size of the cards used in my office. The weight of 1,000 cards is $6\frac{1}{2}$ lbs., and the cubic contents of such a pack 177 cubic inches. The cut corner ensures the cards being always face upwards in the pack, and enables subdivisions of the pack to be "faced" for convenience in sorting. During the fourteen years I have never lost a card, although the packs are often taken from the office to my home.³⁶

Summary.—It will be convenient to sum up the more important suggestions scattered through this paper, and I do so in the briefest possible way, without recapitulating what may be called consequential proposals:—

1. Registration and sanitary areas to coincide.
2. Transference of registration of births and deaths to the sanitary authorities.
3. Compulsory certification of births and deaths by medical practitioners, and notification thereof by relatives, &c., to the medical officer of health.
4. Registration of births and deaths to be extended to still-births.
5. No burial take place without "burial order," such order to be returned to registrar after burial.
6. Adoption of administrative counties, &c., in lieu of registration areas in annual report of Registrar-General.
7. Inclusion of particulars as to estimates of population and sex-age distribution of causes of death.
8. Collation of statistics compiled by the different national and local departments.

I desire, in conclusion, to put in a plea for the establishment of a Central Statistical Office to which all offices or departments publishing "vital statistics" should be affiliated. It will, I think, be apparent that there is even now much unused material awaiting only the creation of such an office to furnish valuable statistics relating to national health.

It seems desirable that such office should be constituted independently of existing Government Departments, and not be formed by extending the work of the Local Government Board or that of its Department known as the General Register Office. The Committee on Physical Deterioration has suggested the formation of an Advisory Council representing "the Departments of State, " within whose province questions touching the physical well-being

³⁶ I have no experience of tabulating machines, such as Hollerith's, so prefer to leave that subject to others.

“ of the people fall, with the addition of members nominated by “ the medical corporations and others,”³⁷ such Council to receive the reports of the Anthropometric Survey and the Register of Sickness,³⁸ and to advise the Government “ on all legislative and “ administrative points concerning public health in respect of which “ State interference might be expedient.” In this Advisory Council lies the germ of the Central Statistical Office. To it should stand referred all the various reports (official and otherwise)³⁹ mentioned in the earlier parts of this communication, with authority to require the alteration of tabulation from time to time as the circumstances of national health, &c., may render necessary. The office should seek to make the “ local ” reports and statistics complementary of the “ national,” and generally exercise such a supervision over the collection and publication of data related to health as will ensure the nation getting the best value for its expenditure—a result which I venture to say is not achieved under the present system or want of system.

Naturally the creation of such an office means some increase of expenditure, but I venture to think that in the end economy will be effected. If not, such expenditure is justified on the ground that a co-ordinated scheme such as has been suggested will give increased knowledge of the presence and spread of preventible disease and of the factors producing deterioration of health, and thus afford greater possibilities of preventing diseases and raising the standard of health.

As every life preserved represents so much capital saved, and the maintenance of the individual in full bodily health means economy in State expenditure and increased productivity, it is true economy to incur the outlay necessary to obtain the information essential to preventive medicine. *Salus civium opes civitatis*—the health of the citizens is the wealth of the State—may be bad Latin, but the sentiment is a good one, one which ought to be inscribed on all municipal buildings and inculcated in all schools.

³⁷ “ Report of Inter-Departmental Committee on Physical Deterioration.” vol. i, p. 85.

³⁸ *Loc. cit.*, p. 84.

³⁹ I attach considerable importance to the data contained in the reports of the various hospitals and in the records of the benefit and friendly societies.

APPENDIX A.

PARISH OF.....

Children's Receiving Home at.....

A Return to be made to the Local Government Board of the Sickness existing in this Home on the first day of each of the Months of January, April, July, and October, in accordance with the Board's letter of the 19th March, 1900.

RETURN for the day of 19 ..

	Boys.	Girls.	Infants (under 7).	Total.
Number of Children under medical treatment apart from healthy Children ...				
Ditto, but not apart from healthy Children				
Total				

	Apert.	Not Apert.	Apert.	Not Apert.	Apert.	Not Apert.	Total Apert.	Total not Apert.
Ophthalmia (1) { Purulent								
Acute { Mucopurulent								
{ Phlyctenular								
Ophthalmia (2) { Trachoma								
Chronic { Follicular Conjunctivitis								
Ringworm								
Scabies								
Other skin affections (stating the kind)								

Detailed particulars of certain cases included in above total.	Cases of the undermentioned ailments which have occurred since previous return.				Cases of the undermentioned ailments remaining under treatment.			
	Boys.	Girls.	Infants (under 7).	Total.	Boys.	Girls.	Infants (under 7).	Total.
Whooping Cough								
Measles								
Scarlet Fever								
Enteric Fever								
Other Fevers (specifying them)								
Diphtheria								
Small-pox								
Chicken-pox								

DEATHS SINCE PREVIOUS RETURN.

Name.	Age.	Cause.	Remarks.

..... Medical Officer of the Home.

Date.....19 ..

..... Clerk to the Guardians.

Date.....19 ..

NOTE.—This Return should be prepared and transmitted to the Clerk so that it may reach the Local Government Board within three days after the first of each of the months mentioned in the heading. If any children have been removed from the Home during the preceding months for treatment in an Infirmary or Hospital, a statement showing the number of children so sent, and the several diseases from which they were suffering, should be appended to this Return.

APPENDIX B.

Cases of Infectious Disease notified during the Year 190 .

Name of District.....

NOTIFIABLE DISEASE.	CASES NOTIFIED IN WHOLE DISTRICT.				TOTAL CASES NOTIFIED IN EACH LOCALITY.							NUMBER OF CASES REMOVED TO HOSPITAL FROM EACH LOCALITY.						
	At Ages—Years.				1	2	3	4	5	6	7	1	2	3	4	5	6	7
	At all Ages.	Under 15.	15 to 25.	25 to 65.														
Small-pox				65 and upwards.														
Cholera																		
Diphtheria																		
Membranous croup																		
Erysipelas																		
Scarlet fever																		
Typhus fever																		
Enteric fever																		
Relapsing fever																		
Continued fever																		
Puerperal fever																		
Plague																		
*																		
Totals																		

D 2

NOTES.—State in space below the name of the isolation hospital, if any, to which residents in the districts, suffering from infectious disease, are usually sent. Mark (H) the locality in which it is situated, or if not within the district, state where it is situated, and in what district. Mark (W) the locality in which a workhouse is situated.

* This space may be used for record of other disease the notification (compulsory or voluntary) of which is in force in the district.

Isolation Hospital.....

APPENDIX C.

Census 1901. Scheme of Tabulation for each "County."

Number of Table.	Subject.	Area of Tabulation.
1 {	Area; Houses and Population, 1891 and 1901	{ Ancient County; Administrative County; Registration County.
2 {	Inhabited Houses and Population, 1901	{ Differences between above.
3 {	Population at each census and decennial } increase decrease	{ Administrative County.
4 {	Area; Houses, 1901; Population, 1891 and 1901	{ Parliamentary Constituencies.
5 {	Inhabited Houses and Population, 1901	{ Ecclesiastical Parishes or Districts—Ancient County.
6 {	Area; Houses, 1901; Population, 1891 and 1901	{ Administrative County; County Boroughs.
7 {	Area; Houses and Population, 1901	{ Petty Sessional Divisions—Ancient County.
8 {	Area; Houses, 1901; Population, 1891 and 1901	{ Administrative County; Urban and Rural Sanitary Districts.
9	" ..	{ Urban Sanitary Districts; Civil Parishes and Wards of same.
10	" ..	{ Rural Sanitary Districts.
11 {	Inhabited Houses, 1891; Population, 1891 and 1901	{ Administrative County: Civil Parishes in.
12 {	Area; Houses and Population, 1891 and 1901; Separate Occupiers, 1901	{ Registration County, Districts and Subdistricts.
13	Area; Population, 1901	{ Detached parts Civil Parishes.
14 {	Inhabited Houses; Population, 1901	{ Changes in Civil Parishes under Local Government Acts, 1888 and 1894; Order of Local Government Board; &c.
15	Area of land, water, and foreshore	{ Registration County: Civil Parishes thereof.
16 {	Occupants of Military and Naval Barracks, Hospitals, and Prisons; H.M. ships in home waters	{ Registration County.
17 {	Occupants workhouses, hospitals, lunatic asylums, prisons, reformatories and industrial schools ..	{ ..
18 {	Persons on seagoing and coastwise vessels; barges and boats	{ ..
19 {	Total tenements and tenements of less than 5 rooms ..	{ Administrative County: Aggregates Urban and Rural Sanitary Districts.
20	" ..	{ Urban Sanitary Districts.
21	" ..	{ Rural ..

Census 1901. Scheme of Tabulation for each "County"—Contd.

Number of Table.	Subject.	Area of Tabulation.
22	<div> <div> Aggregates of Births, Marriages, and Deaths </div> <div>1891-1901</div> </div> <div>Increase or decrease of population</div>	Registration Districts.
23	Ages of population, males and females	Administrative County; Aggregates Urban and Rural Sanitary Districts.
24	Ages of population, persons, males and females	Urban Sanitary Districts.
25	" "	Rural
26	" "	Registration County and Districts.
27	Condition as to marriage and ages of persons, males and females ...	Administrative County: Aggregates Urban and Rural Sanitary Districts.
28	" "	Urban Sanitary Districts con- taining over 50,000 persons.
29	<div> <div> Ages of husbands and wives; of husbands } whose { wives ,, wives } husbands were absent; of widows and widowers </div> </div>	Registration County.
30	Condition as to marriage and age of inmates of workhouses, &c. ...	"
31	Conditions as to marriage and age of inmates of prisons	"
32	Occupations, males and females aged 10 years and upwards	Administrative County.
33	Occupations, males and females aged 10—14 years	"
34	Former occupations of "pensioners" and "retired"	"
35	Occupations (condensed list), males and females aged 10 years and upwards	Aggregates Urban and Rural Sanitary Districts: Urban Districts with population over 50,000 persons.
35A	Grouped occupations, &c.	Urban Districts with popula- tion over 50,000 persons.
36	Birth places, males and females	Ancient County: Urban District with population over 50,000 persons.
37	Country of birth of foreigners	" "
38	<div>Numbers of Blind, Deaf and Dumb, Deaf and Insane. Condition as to marriage, ages, &c.</div>	Administrative County.

APPENDIX E.

BIRTH-CARD.

1905—QR. 1.

Admin. Co. (No.)

San. Dist. (No.)

Sex Legitimate.

Occupation }
of }
Parent } (No.)

Live-birth.

Distinguish an il-
legitimate birth by
a stroke through
"Legitimate."

Distinguish a
still-birth by a
stroke through
"Live-birth."

DEATH-CARD.

1905—Mth'

Admin. Co. (No.)

San. Dist. (No.)

Sex Age

If illegitimate,
strike through
"Legitimate."

Legitimate.

Cause of Death (No.)

Occupation (No.)

If no inquest,
strike out "In-
quest."

Finding of jury
by number.

Inquest (No.)

If patient did
not die in a public
institution, strike
out "Institution."

The class of in-
stitution would be
indicated by a
number.

Institution (No.)

Note.—Smaller cards might be adopted with advantage as regards weight and bulk, but it is doubtful whether they would be as convenient for handling.

DISCUSSION *on* MR. REGINALD DUDFIELD'S PAPER.

MR. THEODORE WRIGHT called attention to a remark of the author as to our being faced with a steadily declining birth-rate. No doubt that was so, but there was reason to think that it was to some extent more apparent than real, and if so, it was very desirable that that difference should be ascertained. It was obvious that if a million females above the age of 60 were added to the population, the birth-rate would apparently decline considerably, although that addition would have no real effect on the birth-rate. Similarly, if an addition were made to the younger population below the age of 15, there would be a similar apparent decline, which would have no present effect, though, of course, the effect would be felt in the future. Owing to the increase in the average length of life, the proportion of population above a certain age was greater than formerly, and as there was reason to hope, there was also some decline in the infantile mortality, there might be a slight increase in that respect. The suggestion he would make, therefore, was that the birth-rate should be calculated and presented as per 1,000 of the female population between certain ages, say 15 and 50—rather than, or at any rate in addition to—per 1,000 of the entire population.

MR. WELTON thought it a great pity that statistics of civil condition as furnished by the Census were only obtainable in comparatively large masses. If one wanted to compare, for instance, the number of births with the number of married women between 15 and 45, there were not the materials to do it. In dealing with the question of the birth-rate, the difficulty felt was owing to the want of coherence in the different publications bearing on the subject.

MR. BAILEY said that he agreed with the author as to the desirability of something being done to establish a unit of area. The old geographical counties were somewhat out of favour, and the author was very anxious indeed to have a unit of area, and he said that everybody knew about the sanitary areas; but, speaking generally, he did not think the public knew about them in the least. Every week there was a publication of the rate of mortality in the towns of this country exceeding 100,000 in population, and that was intelligible to them all; but they did not know anything about sanitary districts. If the area was to be restricted to sanitary districts, he was afraid that would not help them much, as there were both urban and rural districts, and in many places the tendency of the latter was to become urban. He agreed that minute subdivisions were of very little use. Dr. Dudfield spoke of the necessity in estimating the population, of taking into account emigration and immigration; but that would not help them to

arrive at the population of particular places which depended on fashion and all sorts of things. Take for example London. A hundred years ago the City of London was densely populated, but now, as the expression went, nobody lived in the City: but the class formerly resident had not gone to foreign parts but had gone to live in other neighbourhoods.

MR. NOEL HUMPHREYS said that Dr. Dudfield's paper dealt exhaustively with one of the most important branches of statistics, and covered so much ground that it seemed desirable to confine his remarks mainly to the summarised suggestions at the end of the paper. There could scarcely be any difference of opinion as to the importance of assimilating the registration and sanitary areas. For practical public health purposes it was indeed essential that statistics should be available for the areas of local government. He did not think that the reason why this assimilation had not taken place before now was generally understood. There were only two ways in which such a change could be effected. By the first method an Act of Parliament would be necessary, entirely altering the system of civil registration, and providing for the appointment and payment of registrars by some other authority than Poor Law Guardians. Another way of assimilating areas would be the issue by the Local Government Board of Orders altering the boundaries of the Poor Law Unions, and making them agree with sanitary and registration areas. Changes, indeed, were being slowly effected in that direction. In some of the large towns the new boundaries had been made coterminous with the boundaries of local government and poor law administration. They must all hope that accelerated action would be taken in the matter before long. Dr. Dudfield made the very bold suggestion that medical officers of health should take upon themselves the registration of births and deaths. Reading between the lines throughout the paper, Dr. Dudfield seemed desirous that he and other medical officers of health should take upon themselves much additional work. He evidently thought that the medical officer of health, even in such a large urban district as Paddington, could not only register all the births and deaths, a work now occupying three men during the greater part of their time, but could also act as medical referee to the coroner. The suggestion that a medical referee should be attached to every coroner's district was, no doubt, a very good one, although not new, but Dr. Dudfield further proposed that the medical officer should undertake the very onerous, and, he thought, invidious duty of revising all medical certificates issued by the medical practitioners throughout his district. He could not himself believe that even such an energetic medical officer of health as Dr. Dudfield was known to be could undertake all these new duties, and he doubted whether, even if he could, it would be desirable he should do so. Speaking from experience, he knew that doctors did not as a rule make good registrars. In the first place their handwriting, speaking generally, was not clerklly in character: and they were, moreover, apt to lose sight of the fact

that the primary object of civil registration was to effect an accurate and legal record of each birth and death. The medical press and medical men generally seemed to think that the civil registration of births and deaths was mainly devised for the promotion of public health. Civil registration had fortunately been the means of promoting public health, but that was not the primary object of civil registration. With regard to Dr. Dudfield's third proposal, he thought by "compulsory certification" Dr. Dudfield must mean the compulsory notification of births and deaths by medical practitioners. Speaking from long experience, he thought it might be safely assumed that scarcely a single death remained unregistered, and that the number of unregistered births was inconsiderable. Notification of births and deaths by medical practitioners could not be made compulsory without payment for such a duty, and he did not consider that the result would warrant the expense, as the present system of throwing the responsibility on parents and relatives had worked fairly well. As to the proposal for the registration of still-births, he thought they would all certainly like to have some accurate record of still-births and an improvement in the system of certifying still-births for burial. There were, however, many practical difficulties in the registration of still-births, using the term "registration" in its ordinary sense in connection with the registration of births and deaths. At the same time something might be done, possibly through the Home Office, to make it incumbent on all authorities of burial grounds to keep an accurate record of the burial of alleged still-born infants, and to duly file for reference the certificates or declarations of still-birth which authorised such burials. An annual return should also be made to the local authority as to the number of such burials. Some similar arrangement might obviate the necessity for calling upon mothers to register still-births, which would involve obvious difficulty. The suggestion that no burial should be permitted to take place without a burial order, if adopted, would in many cases cause much public inconvenience, and in view of the fact that scarcely a death escaped registration under the present system, seemed to be unnecessary. To have to stop a funeral because an undertaker had left behind him the certificate of registry would be a most vexatious, and, he thought, objectionable proceeding. Dr. Dudfield further suggested that the burial order should be returned to the registrar; it was, however, far from clear why the suggestion was made. The question of the adoption of administrative instead of registration counties for statistical purposes, advisable as it would be, must await the change of registration areas covered by Dr. Dudfield's first suggestion. The demand for greater detail and extended inquiries on the Registrar-General's Reports was mainly a financial question, depending mainly on the Treasury and finally on the Chancellor of the Exchequer. There was much to be said in favour of a national statistical bureau, such as existed in most foreign countries, but that was a subject that called for a separate paper for its discussion. Finally, he would like to enter a most

emphatic protest against the suggestion that was so frequently made by the medical profession, that the relatives of deceased persons should, by some arrangement, be kept ignorant of the assigned cause of death. In the first place he regarded the proposal as an impossibility. In these days of almost universal insurance, the certificate of death must be produced to warrant the payment of the insurance money, and as the register now stood, the certificate must contain the certified cause of death. It appeared to him that both the patient and the patient's near relatives had a right to know what disease was being treated, and what cause was assigned in case of death. Any attempt to hide from relatives the certified cause of death must, in his opinion, fail. The Physical Deterioration Committee, it was true, made the astounding suggestion that the Cause of Death column should be eliminated from the Death Register, and there was ground for fearing that this suggestion was endorsed by some eminent members of the medical profession. This column of the Death Register was added mainly through the influence and at the suggestion of one of the most eminent past Presidents of the Society, Dr. William Farr, and the value of this addition from a public health point of view was inestimable. It was desirable to correct an error which had crept into the paper, viz., that a medical man was under no obligation to give a medical certificate, whereas the 39th section of the Registration Act, 1874, imposed a penalty of 40s. on anyone who refused or failed without reasonable excuse to give or send any certificate in accordance with the provisions of that Act. Registered medical practitioners were therefore bound, under penalty, to give to the best of their knowledge and belief a certificate of the cause of death of a patient attended by them during his or her last illness.

Sir SHIRLEY MURPHY said Dr. Dudfield had given them such a wealth of material that it was not possible to discuss it as a whole, and his own remarks must be limited to one or two points, but he must say he felt that as a Society they were very much indebted to Dr. Dudfield for the very complete way in which he had put his views before the Society. One point upon which Dr. Dudfield touched had interested him particularly, namely, the desirability of the tabulation of the notification returns for the whole country, and he thought everybody would be in sympathy with that. A very excellent beginning was made by Dr. Tatham years ago, to which Dr. Dudfield referred, and which was now continued and further extended by the Local Government Board. The Registrar-General had, moreover, now for a number of years included particulars of the notifications in London in the Weekly and Annual Returns. Dr. Dudfield, in speaking of the duties which might be undertaken by medical officers, expressed the opinion that the medical officer of health might be concerned in connection with the tabulation of deaths for the purposes of the Registrar-General; but his own opinion was that tables showing the various causes of death should be dealt with by a central office, where uniformity of

method could be insured, and that great difficulties would be involved in leaving such tabulation to medical officers of health, however capable. They might, however, be entrusted with the preparation of tables relating to notified cases of infectious disease, to be used by the Local Government Board or the Registrar-General, as no difficulty from want of uniformity could arise. The Registrar-General included in the tables of notified cases of infectious disease which he published, the numbers of notified cases of various infectious diseases in the various districts of London, and the age classification of total cases of scarlet fever, diphtheria, typhus, and so on, for the whole county, the tables being supplied by the county medical officer. That was a very substantial beginning of the classification of the notification returns, and one would like to see the system extended throughout the whole country. Dr. Dudfield did not seem to approve the idea of the county medical officers undertaking this duty, but he thought there would be great advantage in the county medical officer being thus employed, as it would put him in the possession of very early information of a useful sort outside London. That system did not obtain at the present time except by private arrangement with the medical officer of health. He might cite as illustrative of the use to which such information could be put, the fact that in 1894 he found increase in the notifications of enteric fever in areas supplied by the water companies, both inside and outside London, after excessive flood in the rivers. His inquiries, however, necessitated his obtaining knowledge of the behaviour of this disease in several counties. The systematic publication of such returns would enable better watch to be kept over water supplies. He desired to add his thanks to Dr. Dudfield for his paper.

Mr. YULE said that as regarded the important question of area, he agreed with the principle, as an ideal, that the sanitary and registration areas ought to be identical, but as a matter of practice, considering how our registration system had grown up, he doubted the advisability of altering the present registration districts so as to make them identical with the present sanitary districts, or with groups of such districts, constructed as Dr. Dudfield suggested. The adoption of the suggestion would mean an absolute hiatus between the statistics of the earlier period and the later period with respect to the statistics of every area, counties included, except the Kingdom as a whole. As regarded the detailed suggestions as to the nature of the area, it struck him that the scheme put forward on p. 30 would be a little awkward from the standpoint of the rural districts which were merely brought in as the "Rest of the County." Would it not be a great disadvantage, even from the medical officer's point of view, to have such rural areas as it were wholly unlocalised? Epidemics were localised, but the rural areas would not be localised at all. If it were at all practicable to bring the registration districts into identity with the sanitary areas, it should, if possible, be done gradually, by making one registration district identical with one or more sanitary

districts, or by making one sanitary district identical with one or more registration districts, grouping the rural districts to a certain extent, if necessary, if they were too small, rather than leaving them over as a mere remainder in each county. As regarded the point raised by the author, that the importance attached to sanitary area in the census supported the idea of making the sanitary area the registration area, he should like to say that the same fact had struck him from a different point of view. Dealing with the death-rates and so forth, one found all the details given in the Registrar-General's Report for the registration districts, and wanted to compare such rates with the census figures for "overcrowding." These, however, were *not* given for the registration but only for the sanitary districts. He felt, therefore, that in view of the present organisation of statistics, the importance attached to the sanitary areas in the census was rather premature. As regarded the question of local reports, he felt strongly that there should be some central authority which should collate the local reports of medical officers of health, and publish a general report based on them, and embodying the very important original researches of one kind and another that found a place in local reports, and were somewhat difficult to obtain, or being issued only in local reports, were easily overlooked. He would like to make one plea for further information upon a point not touched by Dr. Dudfield, namely, with regard to marriages and births. It seemed to him the time had come when the return of the ages of persons married might very well be made compulsory. It was true that within the last few years the returns of ages at marriage had become very nearly complete, but now he thought they might be made legally compulsory. If the age returns were considered to be now sufficiently accurate, he would also like to see in the decennial supplement issued by the Registrar-General a summary for each registration district of marriages by age, even if the age-grouping was rather crude, the ages of marriage, especially for women, being very important. He would also like to draw attention to the omission from the census, referred to by Mr. Welton, of figures showing the distribution of persons in the registration districts according to age and civil condition. He regretted very much that it had been found necessary to select those figures for omission, as the age-distribution of married women particularly was of vital importance as affecting the birth-rate, and he would have thought the importance of those figures would have secured their retention. They appeared in the censuses of 1871, 1881, and 1891, but whether at an earlier date than 1871, he was not sure. He regretted the breaking of the series very much, though he had no doubt there must have been good reason for the omission, and hoped the data might be included in the next census. He understood, moreover, that it was now impossible to, in part, make up for the omission by stating in the coming decennial supplement the birth-rate for each district worked out for married women between, say, 20 and 45 years of age, or whatever age limit might be fixed upon. As regarded births, he would like similarly

to see a little more detail given in the decennial supplement, not only, for instance, the total birth-rate, but the birth-rate reckoned on women within certain age limits, and, as just suggested, the still more important ratio, the birth-rate reckoned on *married* women within certain age-limits.

Mr. WILLANS wished to utter a word of warning against the danger which might arise from dislike to interfere with the present system of division of the country into registration and sanitary areas on account of the breach of continuity in statistical history which would be thus involved. Confusion abounded at the present time on every hand, and what they wanted was reorganisation, thoroughly and boldly carried out, without fear of any spectres of "hiatus" such as referred to by Mr. Yule. He earnestly hoped Dr. Dudfield would persevere, and that the medical profession would exert their great influence to bring about the reform in this respect which was so strikingly needed.

Mr. E. J. HISCOCK said that Dr. Dudfield had hinted at a portion of the community which would necessarily be responsible for more still-births than any other, and by which the whole thing might be gauged. Repulsive as it might be to allude to it, at the same time they must recognise this fact that really, in many instances, still-born children were left in the hands of the undertaker, and that the work was so covered up that it was not a matter for statistical inquiry at all. No doubt Dr. Dudfield was perfectly right in assuming that some return might be made, and he would suggest that that could be done by placing the obligation upon the undertaker, who was, as a matter of fact, the individual who would have the case in hand.

The CHAIRMAN said that before asking Dr. Dudfield to close the discussion, he would move a vote of thanks to the author for the very comprehensive and useful paper in which the subject had been set before them. The Society welcomed the opportunity of varying the discussion of actual statistics with an occasional consideration of the sources of statistical information, and the means of improving that information in scope and accuracy. Those who doubted the practicability of some of the suggestions before them, would also bear in mind that in administrative, as in legislative work, reforms would be neglected or retarded if an ideal were not kept in sight, continually moving forward and never completely attained. A good deal of this paper should be regarded in that light, and though some of the changes proposed might not be immediately within reach, the statement of them might stimulate the advance of sanitary administration, by keeping the record on the right track, and focussing the attention of those who dealt with the subject upon the more prominent defects of the present system. There was more waste of valuable statistical material in this country than in any other in western Europe, owing to the absence of any central "Clearing-house" in which the *data* collected in various directions could be co-ordinated and worked up into a shape fit for

use; and he was sorry to have to agree with Mr. Noel Humphreys, that in the present circumstances there was not the slightest chance of the establishment of what the Treasury regarded as the unnecessary luxury of a Government Statistical Department. Were there such an institution, not only official statistics, but those derived, as indicated by the author, from private sources, could be adequately collated. On the subject of poverty, for instance, the only statistics available were those of statutory pauperism, but, as pointed out by Mr. Loch in a letter just received, there were other *data* which, with a little organisation, might be obtained. It must be recognised, however, that some risk attended the use of information thus obtained, owing to its not covering the whole field, and also as not being open to the same check and test as that collected by an official organisation. As complementary, however, to the latter, it certainly possessed, as the author indicated, a high value, and the same might be said of the co-operation suggested between official agency and the medical practitioners and midwives, especially as the latter were now developing into a trained and organised body. The discussion had proved that the merits of the paper were thoroughly recognised by those who had listened to it, and the thanks to the author which he now proposed would be, he was sure, cordially and unanimously tendered.

NOTE by Mr. R. DUDFIELD.

It will be more convenient to adopt in my reply the same order as has been followed in the original contribution.

Births.—The suggestion made by Mr. Wright and Mr. Yule that rates should be calculated on females of child-bearing ages has been practised by many medical officers of health for some years. I have included such rates in my reports for the past three or four years, and in the report I now have in hand I am including rates for legitimate births on married women, and for illegitimate on unmarried women—in each case at ages from 15 to 45 years. Mr. Welton thinks that insufficient particulars as to marriage status are given in the Census Reports. Returns are available for each urban sanitary area of 50,000 and upwards (county boroughs). The returns are incomplete in that it is impossible to find out the number of married women of child-bearing ages who are “occupied.” In the condensed tables of occupations the age-division is for all females irrespective of civil condition.

Notification.—Sir Shirley Murphy has misunderstood my proposals for the weekly returns by the Local Government Board. I consider that returns for the whole country would be more useful than a series of separate returns for each county—prepared, in the latter case, by the medical officers of health of the counties. Moreover, as already said, many county councils have not yet appointed medical officers of health.

Deaths.—Mr. Humphreys’s criticisms require the fullest reply. I recognise that many of the changes proposed require fresh legislation, and that such legislation is not likely to be obtained until after much agitation. It is, however, to Mr. Humphreys’s

protest against my suggestions with reference to the certificate of cause of death that I have most to say. I should like to know what is gained by the relatives of the deceased being informed of the cause of death. In many instances they would be pained were they given the simple truth, and would consider the medical practitioner guilty of unnecessary harshness (to use no stronger term). I am sure that the profession would welcome a change which would enable them to put on record a plain statement of the cause of death. To effect this the certificate must be forwarded as a confidential document to the registration authority. At present certain causes of death are undoubtedly understated, and I should have thought that Mr. Humphreys would have welcomed any proposal which would render the mortality statistics more accurate. As to the needs of insurance offices, I fail to see why they should hinder so desirable a reform. It could be arranged for the office to get the information from the Registrar. At the same time, it appears to me that a copy of the registration of the act of dying, apart from the cause of death, should be sufficient.

General.—Mr. Bailey while criticising the proposal to make the sanitary district the unit area, affords a strong argument in its favour. Each of the towns he refers to is a sanitary district. Were the information given with reference to the registration districts, he would fail to recognise the places referred to. In almost every, if not in every, instance the urban sanitary district and the township bearing the same name are co-terminous. Residents of Paddington recognise the sanitary district or borough, but know little or nothing about the registration sub-districts “St. Mary,” “St. John,” and “North-west Paddington.”

The objection to reform based on the inevitable hiatus re-acts in two directions, inasmuch as the changes in boundaries which are at present going on almost continuously, produce disturbances in the series of statistics—disturbances which, with the information furnished, cannot be measured or adjusted. It appears to me to be preferable to “clean the slate” and start afresh—rather than continue on the old lines. Even then the hiatus will only affect statistics for the registration districts and sub-districts, which in their present form appear to me to be of very little utility. It is I think pretty generally admitted that we are not getting full value for the money expended on the present system, therefore, as men of business, we ought to get the system reformed in such a way as shall ensure a better return for the outlay.

I desire, in conclusion, to express my thanks for the attention given to the paper, and particularly to thank those who favoured me with their criticisms, which I think were rather more in support of my contentions than the speakers supposed.

The following were elected Fellows of the Society:—

James Philp Hodge, A.C.A.

John Henry Jones.

Bernard George Pocock, A.S.A.A.

Charles William Silversides.

William B. Taylor, B.A., LL.B.

Bertie Cotterell Wallis, B.Sc. (Economics).

ESTIMATES of AGRICULTURAL LOSSES in the UNITED KINGDOM
during the LAST THIRTY YEARS.

By R. H. INGLIS PALGRAVE, F.R.S.

[Read before the Royal Statistical Society, 21st February, 1905.

Sir FRANCIS SHARP POWELL, Bart, M.P., President, in the Chair.]

WHEN our late President, Major Craigie, asked me to read to the Society the paper which I shall have the honour to put before you this evening, my only hesitation as to agreeing with his wishes was the question whether my remarks would be of sufficient importance. The subject is so vast and the difficulties of making any adequate estimate so great that I could not but feel doubtful whether I was justified in taking up your time. Still, the history of the losses which our largest industry has undergone during the life-time of the past generation and of its existing position fills so important a page in the history of our times, that I hope my contribution to inquiries into the subject may, though incomplete in itself, lead to further investigations which may be of value. I feel also bound by hereditary association to endeavour to be of any service in my power to the Society of which my father, Sir Francis Palgrave, was one of the founders. His autograph stands the eighth in the volume in which the signatures of our early members are preserved, next to that of his friend and fellow-historian, Mr. Henry Hallam.

I feel also an obligation to the Society for having accepted my earliest statistical work, as far back as the year 1869, and for having given me opportunities of reading other papers on later occasions. Bound thus by my duty to the President and to the Society, I have made my present effort, on which I will now proceed.

I have based the main figures of the calculations which I shall put before you on the estimates made by Mr. R. E. Turnbull, who is well known as an agricultural authority, and his work in other directions. The valuable assistance which he rendered to the Society in investigations on the question of the home supplies of food is recorded in the Second Report on the "Production and Consumption of Meat and Milk," printed on p. 368 of the *Journal* for 1904.

Though I have been and am a farmer—happily for myself only a small farmer—and also have been a landowner for a good many years, the stress of other occupations has taken up my time to so large an extent that I could not make by any means so complete a statement myself as Mr. Turnbull has done. The knowledge I have of the subject, however, enables me to enter into the difficulties of making such an estimate, as well as into the difficulties of making farming pay at the present time. As to this last, I may for a moment turn from the main course of our subject to quote a saying attributed to Sir John William Lubbock, the father of Lord Avebury. Sir John was once asked, tradition says, at a meeting of a Farmers' Club, what form of accounts he used, as it was supposed that his book-keeping was the best possible. His answer was characteristic and much to the point. "Gentlemen, if I had kept farming "accounts, I should have given up farming long ago." That method would hardly answer nowadays for most farmers. The statement I have to make is one of losses. "The chief cause "of these and of existing depressions," according to the final Report of the Royal Commission on Agriculture, printed in 1898, "is the progressive and serious decline in the prices of "farm produce." There have been many valuable papers on the position of Agriculture read before the Society in recent years, the titles of some of which I mention in a note,¹ but the subject

¹ "Agriculture in England and the United States" formed the subject of the Inaugural Address of Lord Brassey, then Mr. Brassey, M.P., President of the Society, in November, 1879.

"Ten Years' Statistics of British Agriculture." By Major P. G. Craigie. *Journal of Statistical Society*, 1880.

"On the Home Produce, Imports, Consumption, and Price of Wheat over "the Harvest Years 1852-53 to 1879-80, inclusive." By J. B. Lawes and J. H. Gilbert. *Ibid.*, 1880.

"Statistics of Agricultural Production." By Major P. G. Craigie, late President of the Society. *Journal of the Royal Statistical Society*, 1883.

"The Size and Distribution of Agricultural Holdings in England and "Abroad." By Major P. G. Craigie. *Ibid.*, 1887.

"The Recent Depression in Agriculture, as shown in the Accounts of an "Oxford College." By L. L. Price. *Ibid.*, 1892.

"The Agricultural Depression, and its Effects on a Leading London "Hospital." By J. C. Steele. *Ibid.*, 1892.

"An Inquiry into the Statistics of the Production and Consumption of "Milk and Milk Products in Great Britain." By R. H. Rew. *Ibid.*, 1892.

"A Comparison of the Growth of Wealth in France and England, also of "their Economic Conditions, especially with reference to their Agricultural "Systems." By W. J. Harris. *Ibid.*, 1894.

"An Inquiry into Wheat Prices and Wheat Supply." By R. F. Crawford. *Ibid.*, 1895.

[Notes continued on next page.]

to which I desire to draw your attention is hardly stated collectively in any of them.

There are three principal points to be included in the estimate of agricultural losses :—

- (1) The decrease in the value of agricultural produce since the years 1872-77, which we will take as the base of our computation.
- (2) The diminution in the value of farming capital.
- (3) The drop in the value of land in the United Kingdom since that time.

I will begin with the decrease in the value of the produce of the land.

The estimated amount of the decrease in the value of agricultural produce during the twenty-six years, from 1878 to 1903, both inclusive, stated below, is calculated on the annual value of agricultural produce in the United Kingdom for each year since 1878, as compared with its value before and in the year 1877. The average annual value of the agricultural produce for the six years, 1872-77, given by Mr. R. E. Turnbull, and quoted by Mr. R. Henry Rew in the "Journal of the Royal Agricultural Society for 1895," is taken as the starting point in this paper. Mr. Turnbull's estimate of the value of the gross farm revenue of the United Kingdom from 1872 to 1877 was 255,000,000*l.* a year. He also estimated the value of the corresponding produce in the years 1892-97 as 175,000,000*l.* a year. What I have desired to do is to continue

"The Colleges of Oxford and Agricultural Depression." By L. L. Price. *Ibid.*, 1895.

"Agricultural Credit Banks." By R. A. Yerburch, M.P. *Ibid.*, 1896.

"Agriculture in Essex during the past Fifty Years, as exemplified by the "Records of one Farm." By F. C. Danvers. *Ibid.*, 1897.

"Notes on the Food Supply of the United Kingdom, Belgium, France and "Germany." By R. F. Crawford. *Ibid.*, 1899.

"The British and Continental Farmer." By R. H. Hooker. *Ibid.*, 1899.

"Report of the Committee to Inquire into the Statistics available for "Estimating the Production and Consumption of Meat and Milk in the United "Kingdom." *Ibid.*, 1902.

"Second and Third Reports of the same Committee." *Ibid.*, 1904.

"Memorandum of some Estimates of the Production of Meat and Milk." By R. Henry Rew. *Ibid.*, 1902.

"Agricultural Wages in England and Wales during the Last Half "Century." By A. Wilson Fox, C.B. *Ibid.*, 1903.

"Observations on the Production and Consumption of Meat and Dairy "Produce." By R. Henry Rew. *Ibid.*, 1904.

"The Accounts of the Colleges of Oxford, 1893-1903, with Special "Reference to their Agricultural Revenues." By L. L. Price. *Ibid.*, 1904.

the estimate for the years between 1872-77 and 1892 and from 1892-97 to the present time.

The method by which my estimate was arrived at was formed in the following manner:—

In order to trace the value of the agricultural produce for each year, the unweighted percentage variations in prices of selected articles of "food and drink" were taken from the "Report on Wholesale and Retail Prices in the United Kingdom in 1902," prepared by the Board of Trade in 1903.

This Report gives the percentage increase or decrease of prices in each year from 1872 to 1902 as compared with 1871, showing thus the proportion that the price of every article mentioned bore each year to the price for 1871, which is taken as the base year. This was done both for the crops and for the animal produce. I have taken the figures for wheat, barley, and oats as representing corn crops, and those for beef, mutton, bacon, milk, eggs, and wool as representing animal produce.

The value of the total depends on the prices of both these classes of produce, and both must be taken into account. The value of the prices of "crops" may roughly be taken as being about equal to that of "animal food." The calculations made by Mr. William C. Little in 1886 of the value of the three chief corn crops and of beef, mutton, and wool for the years 1866-75 and 1876-85, show that in his opinion this division is approximately correct. Hence in order to obtain figures which will represent the prices of the two branches of agricultural produce combined, half the proportional prices of "crops" have been taken with half of the proportional prices of "animal produce."

Thus, for example, for 1872:—

One-half of 98·6, the proportion that the price of crops, estimated, as above stated, in that year, bears to the price in the base year (1871), is added to

„ 95·4, the proportion which the price of animal produce bears in 1872 to the price in the base year.

One-half of 98·6 = 49·3

„ 95·4 = 47·7

97 is therefore the index number for 1872.

This has been done for every year from 1872 to 1903, and the figures resulting have been used as a column of index numbers (column 1, Table I) for the column representing the annual value of the produce (column 2, Table I).

TABLE I.—*Estimated Annual Value of Agricultural Produce in the United Kingdom from 1872 to 1903, the period 1872-77 being taken as the Base Line.*

Year.	Column 1. Index Number.	Column 2. Annual Value of Produce.	Column 3. Difference each Year between Annual Value and Average Annual Value of 1872-77.
		£	£
1872	97·0	233,000,000	—
'73	108·1	259,800,000	—
'74	111·4	267,700,000	—
'75	108·3	260,300,000	—
'76	104·3	250,600,000	—
'77	107·5	258,600,000	—
'78	102·9	247,200,000	7,800,000
'79	92·0	221,000,000	34,000,000
1880	94·5	227,000,000	28,000,000
'81	93·2	224,000,000	31,000,000
'82	95·0	228,200,000	26,800,000
'83	93·2	224,000,000	31,000,000
'84	85·9	206,200,000	48,800,000
'85	89·3	214,500,000	40,500,000
'86	76·9	184,600,000	70,400,000
'87	74·6	179,300,000	75,700,000
'88	77·2	185,400,000	69,600,000
'89	76·2	183,000,000	72,000,000
1890	77·7	186,600,000	68,400,000
'91	79·3	190,600,000	64,400,000
'92	76·7	184,200,000	70,800,000
'93	76·9	184,600,000	70,400,000
'94	72·0	173,000,000	82,000,000
'95	67·7	162,600,000	92,400,000
'96	67·0	160,800,000	94,200,000
'97	70·2	168,600,000	86,400,000
'98	73·0	175,300,000	79,700,000
'99	69·4	166,200,000	88,800,000
1900	71·7	172,400,000	82,600,000
'01	72·7	174,800,000	80,200,000
'02	77·1	185,200,000	69,800,000
'03	72·1	173,200,000	81,800,000
Total from } 1878 to } 1903 }	—	4,982,500,0·0	1,647,500,000

I have carried the annual value of the produce on continuously for the years which Mr. Turnbull's statement does not supply, thus giving the figures shown in column 2, which are arrived at in the following manner:—

The average for the index numbers for 1872-77 works out thus:—

1872	97
'73	108·1
'74	111·4
'75	108·3
'76	104·3
'77	107·5
	<hr/>
	6)636·6
	<hr/>
	106·1
	<hr/>

Then all succeeding index numbers are worked out according to the plan shown above.

Thus the sum for 1878, 247,200,000*l.*, represents the proportion which the index number of that year, 102·9, bears to 106·1, in reference to 255,000,000*l.*, and all the other figures in column 2 are arrived at in the same way.

Having thus explained the basis on which I have estimated the prices, I will turn to the figures given by Mr. Turnbull. His estimate was:—

255,000,000*l.* on average each year for 1872-77.

175,000,000*l.* on average each year for 1892-97.

Mr. Turnbull's average, 255,000,000*l.*, for the period 1872-77 is taken, as mentioned, for the basis of the figures in column 2 of Table I, and you will observe that the average of the six years, 1872-77, works out as 255,000,000*l.*

As mentioned, the figures in column 2 for the first six years work out, when averaged, as 255,000,000*l.* When the years 1892-97 are reached, the average of the figures for those six years is 172,300,000*l.*, closely approximating Mr. Turnbull's estimate for that period, namely, 175,000,000*l.*²

I give the actual figures from column 2 to make this clear:—

TABLE II.—*Value of Gross Products for the Years 1872-77 and for 1892-97.*

£		£	
1872	233,000,000	1892	184,200,000
'73	259,800,000	'93	184,600,000
'74	267,700,000	'94	173,000,000
'75	260,300,000	'95	162,600,000
'76	250,600,000	'96	160,800,000
'77	258,600,000	'97	168,600,000
	<hr/>		<hr/>
	6)1,530,000,000		6)1,033,800,000
	<hr/>		<hr/>
	255,000,000		172,300,000
	<hr/>		<hr/>

² The estimated value of the several items included in these totals is given in the Appendix, Table 2.

I have tried several estimates of the value of the produce, and this is the nearest I can make which will agree with Mr. Turnbull's figures of the annual value of the produce of the years 1872-77 and of the years 1892-97. As my calculations agree so closely with Mr. Turnbull's at these two points, I think that I may consider that the estimates made for the intervening years would agree fairly with the figures which Mr. Turnbull would have shown had he worked these out for each year, or at least that they are close enough to justify the use of them as a basis for calculation. In cases like this estimates are all that can be made, and I can find no basis more practical than that which Mr. Turnbull has supplied.

Had I possessed Mr. Turnbull's estimates for each year from 1872-77 onwards there would, of course, have been no need for this calculation. I should greatly have preferred Mr. Turnbull's figures to my own, but when I inquired, through Mr. Rew, whether these estimates existed, Mr. Turnbull answered, "I have burnt a large quantity of statistical work relating to the 'seventies and eighties, and am unable to give estimates for each 'year since 1872.'" This, personally, I regret most sincerely, and I am sure that the Society will agree with me in this, that so much of Mr. Turnbull's valuable work has thus been lost to us. I have, however, endeavoured to fill the deficiency from the basis his figures give.

Mr. Turnbull adds that for 1903 "I should think the gross 'revenue from all sources, including unenclosed land, has been '180,000,000*l.*, or about 3*l.* 15*s.* per acre. Possibly it may have 'been 185,000,000*l.*, or about 3*l.* 17*s.* 6*d.* per acre. That is the 'outside.'" In making this estimate, Mr. Turnbull has reckoned the average acreage to which he refers in the United Kingdom as 47,755,500. As I have not included the produce of the unenclosed land, I may consider Mr. Turnbull's estimates as practically agreeing with my own of 173,200,000*l.* for 1903, for I think the smaller figures which Mr. Turnbull gives are the nearest to the facts.

We have now to attempt to sum up the drop in the value of agricultural produce in the United Kingdom from 1877 onwards. I have endeavoured to estimate it, as mentioned above, by taking the difference between the value of the produce each year from 1878 onwards and the amount of 255,000,000*l.*, estimated by Mr. Turnbull as the average annual value in 1872-77. This difference is shown in column 3 of Table I. It amounts in all to 1,647,500,000*l.* Had the value of the produce remained on the level of the years 1872-77 for the twenty-six years 1878-1903—

	£
It would have been	6,630,000,000
But it was, as shown by column 1	4,982,500,000
Being a drop, as mentioned above, of.....	1,647,500,000

In round figures, a loss of 1,640,000,000*l.* in the twenty-six years. This calculation should now be carried one year further, for 1904. Considering the prices, and the yield of the crops in 1904, about 60,000,000*l.* should be added to bring the figures up to the present date. This means about 1,700,000,000*l.* in all.

I do not say this is all a loss to the country by any means, but it appears to me to include a loss to the producer which is very considerable to him. Had the value of the agricultural produce of the country continued on the same level as it was in 1872-77, it may reasonably be supposed that it would have been produced at much the same rate of profit as it was then. Judging by present conditions, I think we may roughly take it that the farmers' profits, and the wages of the numerous labourers who have left the land since that date, and who are no longer supported out of the produce, would have amounted at least to one-third of the gross price. This is lost to the various interests concerned, and in round figures amounts to 500,000,000*l.*

I have now to sum up the total loss of agriculture during the last thirty years, and will begin with the loss in the capital value. With respect to this, the Final Report of the Commission on Agriculture, printed in 1898, records (p. 23) "a decline of nearly 1,000,000,000*l.* in the capital value of land in the United Kingdom" as having occurred between 1875 and 1894. May I assume that the value has remained stationary since?

The figures for the years 1893-94 onwards in Tables I and III, corroborated by the statements in Tables IV and V, support this opinion, and it appears that the owners' loss since 1875-77 may be placed at that sum.

When I turn to the pamphlet by Mr. R. Henry Rew,³ "Farm Revenue and Capital," there are in it at p. 7 several estimates of farmers' capital in the United Kingdom. Of these, Sir James Caird's for 1878, 400,000,000*l.*, Major Craigie's for the same year, 376,000,000*l.*, are so fairly approximate that I think we may take them to correspond. The Treasury figures for 1885 show 300,000,000*l.*

As I have desired to lay before the Society all the information in my power, I wrote to the principal Chambers of Agriculture in

³ Reprinted from the "Journal of the Royal Agricultural Society of England." 3rd series, vol. vi, part i, 1895.

Great Britain, inquiring into the amount of farmers' capital in their districts. I add a summary of the answers I received here.

I regret that pressure of work did not allow me time to make inquiries in Ireland.

Summary of Statements of Farming Capital in Appendix.

Statement Number.	Locality.	Grass.	Arable Land.	Total.	Amount of Capital required per Acre.
		Acre.	Acre.	Acre.	£ s.
1	Hampshire (A) ^a	66	140	206	8 10
2	„ (B) ^b	200	200	400	6 15
3	Leicestershire ^c	150	100	250	8 11
4	Lincolnshire	71	296	367	7 18
5	„	130	106	236	10 6
6	„	64	156	220	8 9
7	„	37	219	256	8 -
8	Monmouthshire	200	50	250	6 -
9	Norfolk	50	200	250	8 -
10	„ or Suffolk ^d	50	200	250	11 6
11	Somerset (mixed land)	—	—	—	8 6
12	Suffolk (East) (A)	50	200	250	10 -
13	„ „ (B)	18	50	68	4 4
	Surrey (Surbiton) ^e	rough estimate			10 -
15	Sussex (Lewes) ^f	125	125	250	10 17
16	„ „ (Rye) ^g	180	70	250	7 15
	Yorkshire—				
17	West Riding ^h	60	40	100	10 -
18	{ North Riding and South Durham ⁱ }	50	200	250	9 -
19	East Riding (A) ^j	50	200	250	8 15
20	„ „ (B) ^k	50	200	250	7 -
21	Wiltshire ^l	300	350	650	5 15

^a Of the pasture (66 acres), 50 acres are Down pasture (sheep run). There would be no returns till sheep are sold, so estimate is made for household expenses, rent, and labour for half-year.

^b As there is here a large dairy return commencing at once, no estimate is given for household expenses, rent, and labour.

^c By the end of May of the first year, wages and all charges should be paid out of profits on sheep, wool, and fat stock, and are not allowed for in estimating the capital.

^d Casual profits from cows, fowls, &c., would go towards living, but probably 100*l.* or more must be added to this estimate and provided as capital for the first year.

^e The different holdings in Surrey vary much in size and conditions. To quote three examples: “280 acres, wages about 900*l.* per annum, with nearly “80 cows; 700 acres, 40 grass, 200 cows, and immense wages; 500 acres, “5 grass, 12 horses the only stock, wages small.”

^f A Sussex Weald farm. This would be a well-stocked farm. There are not many such.

[Notes continued on next page.]

¶ In the south-eastern district adjoining Romney Marsh. Of the pasture (180 acres) 80 acres is marsh and 100 upland pasture. About half of the latter has been laid down during the last thirty-five years, and is very poor stuff.

^h Entirely a milk farm. The average size of the farms in this neighbourhood is usually under 100 acres; on one large estate the average size of the holdings is about 20 acres. The great proportion of the district is under permanent grass, and the trade carried on is simply the supply of new milk to the large towns of the populous surrounding districts. Practically very few sheep are kept on account of the impossibility to do so from the depredations of dogs. The rent of this farm averages 30s. an acre, and the rates 6s. an acre. No allowance is made for these or for household expenses, which would all probably be covered by the profits from milk sold.

ⁱ There are many farms in this district where the capital does not exceed 5*l.* an acre and even less. The proportion of grass land and arable is not the usual proportion in this district. All implements and harness are supposed to be new, also that the tenant has the first year's rent and wages in hand, as the fact of the outgoing tenant having one-third of the arable land for his away-going crop, there would not be very much to sell for the first year. There would be small sales to provide for the living of the first year.

^j Only half-a-year's labour bill is allowed here. If the farmer has no debts after harvest, and has his farm fully stocked, he will be able to pay his way and his rent. In Yorkshire the Lady-day tenant sows his own root-crops and takes the unused manure and the away-going crop by valuation. The value of the latter is included in the estimate, although it would not be payable till February following. The estimate makes no allowance for living expenses. Small sales, milk, poultry, and pigs, would cover this.

^k Thirty years ago the amount of capital per acre required would have been 10*l.*

^l Allowance is made for a half-year's rent and labour, as there are no returns until the wool is sold in July, except for the milk sold, and this is allowed for household expenses. Of the pasture (300 acres), 50 acres are water meadow and pasture, and 250 down pasture (sheep run).

The statements themselves are printed in the Appendix. These average about 8*l.* or 9*l.* an acre, but we have to remember that they represent the best-equipped farms, and in many of the letters that reached me I have been told that the general average was considerably lower.

The acreage under all crops for Great Britain and Ireland may be taken on the average of the last five years as about 47,500,000 acres. Can we take the value of the farming capital at 6*l.* an acre? I believe this to be excessive, and should be more inclined myself to put it lower. Taken at 6*l.* an acre, this means roughly a value of 285,000,000*l.* at the present time. This would show a drop in round figures of about 100,000,000*l.* since 1878, if we take Major Craigie's figures as the base for comparison, and more if we take Sir James Caird's. I believe this to be approximately near the mark.

We have now to estimate the drop in farmers' profits on the produce of the land which are not included in any of the figures I have given. If we take it as about 33 per cent. of the value of the farm produce as the drop in the value of these since 1872-77 is roughly 1,700,000,000*l.*, the diminution in the farmers' profits would be more than 500,000,000*l.*

To recapitulate, according to the figures I have given, the losses of agriculture in the United Kingdom between the years 1872-77 and 1904 have collectively been about 1,600,000,000*l.*, namely :—

	£
Diminution in owners' capital.....	1,000,000,000
„ farmers' „	100,000,000
„ „ profits.....	500,000,000
Total.....	<u>1,600,000,000</u>

I may observe at this point that some remarks about the position of agricultural interests made at the present time appear scarcely intelligible to persons acquainted with agricultural matters. In these remarks it is frequently assumed or stated that the recent drop in the value of land had been from a level to which it had been raised by a Protective tariff. But this is far from being the case. The reduction dates from about the year 1877. The annual value of the land in the United Kingdom is given in the thirty-fourth number of the "Statistical Abstract" as 68,000,000*l.* for the years 1877-81, from which years the progressive decline dates till, in the fifty-first number, the corresponding value is given for 1902-03 as 52,000,000*l.* Similar evidence is given in the "Final Report of the Royal Commission on Agricultural "Depression," printed in 1898. In this the date from which the drop in the capital values of lands commenced is estimated as from 1875. The estimate extends up to the year 1894, and shows a drop in those twenty years of 50 per cent. in the capital value. Now, as the principles of Free Trade prevailed more than twenty-five years earlier than 1877, it is clear that the price of land in 1875 and 1877 was not the result of Protection. The price then was the natural value and nothing more.

Agriculturists cannot now in any way look to Protection as an assistance out of their difficulties. This must be sought, under existing conditions, in other directions.

No duty could possibly under any circumstances be proposed on the produce of Canada. Wheat grown there is as much British produce as if it had been grown in Yorkshire. A duty of 2*s.* a quarter on wheat, with a preference to our Colonial possessions,

would, with the large supplies they can already send us, and the prospects of a great increase in the near future, have no effect in raising prices here.

There is one encouraging point in Table I which should be mentioned, and it is this: the annual value of the agricultural produce for the last ten years appears fairly to have kept on a level. This has not been brought about by the wheat crops. The value of the wheat crop is shown by Table III

TABLE III.—*The Annual Value of the Crops of Wheat, Barley, and Oats in the United Kingdom from 1884 to 1903.*

	Wheat.	Average Price per Year per Imperial Quarter.	Barley.	Average Price per Year per Imperial Quarter.	Oats.	Average Price per Year per Imperial Quarter.	Total.
	£	s. d.	£	s. d.	£	s. d.	£
1884....	18,293,000	35 8	15,316,000	30 8	20,427,000	20 3	54,036,000
'85....	16,341,000	32 10	16,117,000	30 1	20,640,000	20 7	53,098,000
'86....	12,273,000	31 -	13,012,000	26 7	20,113,000	19 -	45,398,000
'87....	15,483,000	32 6	11,106,000	25 4	15,314,000	16 3	41,893,000
'88....	14,820,000	31 10	12,967,000	27 10	16,538,000	16 9	44,325,000
'89....	14,108,000	29 9	12,061,000	25 10	18,202,000	17 9	44,371,000
1890....	15,797,000	31 11	14,475,000	28 8	19,892,000	18 7	50,164,000
'91....	17,285,000	37 -	14,004,000	28 2	20,809,000	20 -	52,098,000
'92....	11,490,000	30 3	12,582,000	26 2	20,850,000	19 10	44,922,000
'93....	8,379,000	26 4	10,512,000	25 7	19,756,000	18 9	38,647,000
'94....	8,748,000	22 10	11,035,000	24 6	20,377,000	17 1	41,160,000
'95....	5,523,000	23 1	10,277,000	21 11	15,811,000	14 6	31,611,000
'96....	9,526,000	26 2	11,147,000	22 11	15,013,000	14 9	35,686,000
'97....	10,614,000	30 2	10,664,000	23 6	17,292,000	16 11	38,570,000
'98....	15,912,000	34 -	12,688,000	27 2	19,862,000	18 5	48,462,000
'99....	11,109,000	25 8	11,916,000	25 7	17,654,000	17 -	40,679,000
1900....	9,138,000	26 11	10,674,000	24 11	18,147,000	17 7	37,959,000
'01....	9,016,000	26 9	10,641,000	25 2	18,550,000	18 5	38,207,000
'02....	10,229,000	28 1	11,941,000	25 8	23,217,000	20 2	45,387,000
'03....	8,161,000	26 9	9,252,000	22 8	18,554,000	17 2	35,967,000

to have been lower for 1903 than for any other year in which a record has been kept except 1895. The area on which wheat has been grown is shown in Table IV. It has largely diminished during the last ten years. The crop of barley has remained more on the same level, though the land devoted to it is smaller in area than ten years since, and the price, on average, is lower. Oats rather more than hold their own, though the price is low. The explanation as to the general value having fairly though not fully maintained itself appears to be in the numbers of horses, cattle, sheep and pigs. These are given in Table V, and the record is on the whole encouraging, though the increase is not proportionate to that of the land employed as pasture.

TABLE IV.—*Number of Acres under Wheat, Barley, and Oats, and Total Area under Cultivation in the United Kingdom in each Year from 1884 to 1903.*

	Acreage under Wheat.	Acreage under Barley.	Acreage under Oats.	Total Acreage under Wheat, Barley, and Oats.	Total Cultivated Area.
	Number of Acres.	Number of Acres.	Number of Acres.	Number of Acres.	Number of Acres.
1884	2,751,000	2,346,000	4,227,000	9,374,000	47,841,000
'85	2,553,000	2,447,000	4,282,000	9,282,000	47,896,000
'86	2,358,000	2,433,000	4,419,000	9,210,000	47,932,000
'87	2,387,000	2,255,000	4,419,000	9,061,000	47,874,000
'88	2,668,000	2,264,000	4,177,000	9,109,000	47,877,000
'89	2,545,000	2,316,000	4,140,000	9,001,000	47,931,000
1890	2,483,000	2,301,000	4,138,000	8,922,000	48,045,000
'91	2,392,000	2,299,000	4,129,000	8,820,000	48,179,300
'92	2,299,000	2,220,000	4,238,000	8,757,000	47,976,000
'93	1,955,000	2,251,000	4,436,000	8,642,000	47,992,000
'94	1,980,000	2,268,000	4,524,000	8,772,000	47,922,000
'95	1,456,000	2,346,000	4,528,000	8,330,000	47,884,000
'96	1,734,000	2,286,000	4,304,000	8,324,000	47,883,000
'97	1,939,000	2,213,000	4,226,000	8,378,000	47,871,000
'98	2,158,000	2,069,000	4,098,000	8,325,000	47,793,000
'99	2,055,000	2,159,000	4,110,000	8,324,000	47,795,000
1900	1,901,000	2,172,000	4,146,000	8,229,000	47,795,000
'01	1,746,000	2,141,000	4,112,000	7,999,000	47,760,000
'02	1,773,000	2,083,000	4,157,000	8,013,000	47,753,000
'03	1,621,000	2,020,000	4,257,000	7,898,000	47,708,000

TABLE V.—*The Numbers of Animals kept in the United Kingdom Annually from 1884 to 1903.*

	Cattle.	Sheep.	Pigs	Horses.	Total.
	Number.	Number.	Number.	Number.	Number.
1884	10,423,000	29,377,000	3,906,000	1,905,000	45,611,000
'85	10,869,000	30,086,000	3,687,000	1,909,000	46,551,000
'86	10,873,000	28,955,000	3,497,000	1,928,000	45,253,000
'87	10,640,000	29,402,000	3,721,000	1,937,000	45,700,000
'88	10,269,000	28,939,000	3,816,000	1,937,000	44,961,000
'89	10,273,000	29,485,000	3,006,000	1,945,000	45,609,000
1890	10,790,000	31,667,000	4,362,000	1,965,000	48,784,000
'91	11,344,000	33,534,000	4,273,000	2,026,000	51,177,000
'92	11,520,000	33,613,000	3,263,000	2,067,000	50,493,000
'93	11,207,000	31,775,000	3,278,000	2,079,000	48,339,000
'94	10,780,000	30,038,000	3,794,000	2,092,000	46,704,000
'95	10,753,000	29,773,000	4,239,000	2,112,000	46,877,000
'96	10,942,000	30,854,000	4,300,000	2,115,000	48,211,000
'97	11,005,000	30,567,000	3,683,000	2,070,000	47,325,000
'98	11,150,000	31,103,000	3,719,000	2,040,000	48,012,000
'99	11,345,000	31,681,000	4,003,000	2,028,000	49,057,000
1900	11,455,000	31,055,000	3,604,000	2,000,000	48,174,000
'01	11,478,000	30,830,000	3,411,000	2,012,000	47,731,000
'02	11,377,000	30,057,000	3,640,000	2,023,000	47,097,000
'03	11,408,000	29,659,000	4,086,000	2,070,000	47,223,000

Our attention should be given to the adaptation of our cultivation to those articles which can withstand foreign competition best. When we consider the enormous imports of milk, cheese, butter, eggs, and bacon, we may have hopes of finding a field for improvement in our production. With regard to bacon, the imports of flour have been particularly disadvantageous. Wheat contains other products, such as bran, which are particularly useful for producing bacon. These, however, do not keep long, as from their nature they turn mouldy and spoil rapidly, hence they cannot stand the voyage to Europe and remain in the exporting country, which is generally the United States, and come over here in the form of bacon. This gives the exporter in the United States an advantage over the pig-grower here. I have myself paid nearly as much, and even as much, for bran and pollard as I have paid for flour. The price of these articles in this country is enhanced by the demand for them being thus artificially sustained. A tax on the import of flour could not in any way affect the price of bread, as the freight of the flour appears to be more costly than the freight of the wheat, while the increased import of the wheat would incidentally be an advantage to the farmer as well as to the miller. Attention to this point would be a help to the pig industry. I observe that it has been stated that an increase of the export of bran and "offals" has followed an increase of "milling" in this country, but I take it this means that farmers have not yet understood the advantage which the increase of their opportunities in this respect will give them.

A system of co-operation would be of service, but this would have to be introduced among a population to which the idea of co-operation is at present but little known, and some time must pass before such a system can become at all general. Progress, however, is being made, and the Agricultural Organisation Society is energetically endeavouring to introduce the system.

Improved agricultural machinery may be an assistance where the farmer has the means of providing it. The paper on the influence of "Farm Machinery on Production and Labour in the United States," by Dr. H. W. Quaintance, of the University of Missouri, published by the American Economic Association, November, 1904, gives a very interesting survey of the introduction and development of the use of machinery on farms in the United States. Farm machinery is well known in this country, but in the United States it has attained far larger proportions. It has caused a great decrease in the amount of labour employed: in the cultivation of wheat about 72 per cent., of barley much the same, of hay about 67 per cent. The greater rapidity with which the work is done is also a considerable advantage.

The increased use of machinery has been followed by an increase in the size of the farms. The average size of the farms in the United States is given in the census of 1900 as 147 acres, but this doubtless includes great variations in size. The corresponding size of holdings of all classes in Great Britain is given by Major Craigie (p. 92, *Journal of the Royal Statistical Society* for 1887) as 58·7 acres. A general average covers often great differences, but it is well known that farms in the United States are, as a rule, a good deal larger than in the United Kingdom, and this, no doubt, facilitates the use of machinery.

The capital employed on the farms in the United States has been increased since the development of machinery, and also largely the quantity and weight of the crops produced. How far the introduction of much machinery is possible in this country experience only can decide, but the heavy losses which farmers in the United Kingdom have experienced must hamper them in the outlay of fresh capital, however advantageous the employment of labour-saving machinery might be. The great advantage of more rapid work will, however, be appreciated by those who have experience of harvesting a crop in unsettled weather. Higher wages to the labourer earned in a shorter time and with diminished exertion promise much. It would be unsuitable here to go into more detail on this point, but I may end this short reference to a development which no doubt has a good deal to do with the low price at which crops in America are produced, and which may be expected to become more important in the future, with the following quotation from Dr. Quaintance: "By lightening the tasks of those who labour with their hands, and by increasing the quantity of the necessities of life which a given amount of labour can produce, machinery has not only favoured a higher standard of living, but has increased the chances of attaining it."

It is depressing to turn from the flourishing position of agriculture in another country to the state of matters in our own. I speak as inhabiting one of the districts of East Anglia which has suffered most acutely from the drop in the price of the produce. Several small farmers, tenants of my own, have told me, and I believe correctly, that the maintenance of themselves and of their families at the same rate as that of their labourers is all that they have obtained from their farms last year, and I believe that there are many in a similar position.

Under these circumstances, something might be done by the Government in alleviating the losses of agriculture by reducing rates and taxes whilst matters are in this condition. There are precedents for this. The loss to France by phylloxera was fully

400,000,000*l.* Whilst this disease occurred the land which suffered was exempted from the *impôt foncier*. Something like this should be done in England. It is said sometimes that any assistance of this description goes to the landlord, and to no one else. My own experience is entirely the other way. The landlord is the last man to benefit from any improvement in agriculture, and naturally, as the farmers come first.

It must, I fear, be long before a real turn in the position of agriculture arrives; meanwhile, it is best for all concerned that we should be aware of the real position of affairs. We have become so accustomed to dependence for our food supply on other countries that we overlook the risks which such a condition must involve—the heavy price which we are paying for our manufacturing position—and the opportunity which we still have of making our needs a bond of union with our colonies, and hence a source of strength to our position as a country.

The position of the labourers employed is largely improved, but while I record this improvement with satisfaction, I have also to express my deep regret at the diminution in their numbers that has occurred. One out of every three labourers at least has left the land during the period referred to in this paper.

APPENDIX.

TABLE I.—*Summary showing Estimated Capital Employed on Farms in various Localities.*

Reference No.	1	2	3	4	5	6	7	8	10
Locality	Hampshire.	Hampshire.	North Leicestershire.	Lincolnshire.	Lincolnshire.	Lincolnshire.	Lincolnshire.	Monmouth.	Norfolk or Suffolk Typical Farms.
Area of farm—									
Arable in acres	140	200	100	296	106	156	219	50	200
Pasture.... „	66	200	150	71	130	64	37	200	50
	£	£	£	£	£	£	£	£	£
Covenants	370	600	320	105	92	327	327	200	400
Cart horses.....	180	210	125	429	106	403	431	100	300
Bullocks	90	30	900	1,370	1,034	1,232	807	200	400
Sheep	525	437	240					150	300
Cows	—	810	—					150	60
Pigs	—	—	15	43	23	24	58	40	20
Fowls	5	5	5	—	—	6	5	5	5
Carts, implements, tools, machines, &c.	230	500	160	498	145	225	278	100	150
Seed corn	60	70	27	—	—	—	—	20	50
Clover and grass seed	—	—	12	—	—	—	—	10	25
Corn for horse keep	35	—	12	—	—	—	—	80	100
Cake and artificial food, artificial manure, &c.	—	—	75	—	—	—	—	100	100
Produce : hay, corn, potatoes, &c.	—	—	—	697	431	56	317	—	—
Farm labour	110	—	60	—	—	—	—	150	375
Rent	60	—	—	—	—	—	—	125	125
Horse and trap	—	60	50	—	—	—	—	50	50
Rates and insurance	5	—	25	—	—	—	—	30	30
Household expenses	75	—	—	—	—	—	—	—	—
	1,745	2,722	2,026	3,142	1,831	2,273	2,223	1,510	2,490

TABLE I *Contd.*—Summary showing Estimated Capital Employed on Farms.

Reference No.	11	12	13	15	16	17	18	20	21
Locality {	Somer- set.	Suffolk.	Suffolk.	Sussex Weald.	Sussex.	York- shire.	South Durham.	York- shire.	Wilt- shire.
Area of farm—									
Arable in acres	} 260	{ 200	50	125	70	40	200	200	350
Pasture.... „									
	£	£	£	£	£	£	£	£	£
Covenants	89	500	120	550	200	325	100	500	620
Cart horses.....	150	250	45	200	100	120	250	240	360
Bullocks	750	300	14	500	320	} 27 {	300	220	—
Sheep	500	300	—	300	500		180	360	1,262
Cows	81	60	45	—	80		36	65	270
Pigs	80	30	} 12 {	20	3	30	—	15	—
Fowls	5	10		10	10	5	5	7	5
Carts, implements, tools, machines, &c.	250	200	50	—	140	120	300	175	400
Seed corn	40	50	—	—	15	—	20	35	100
Clover and grass seed	20	25	—	—	7	—	40	25	27
Corn for horse keep	50	100	—	} 400	{ 25	—	10	60	80
Cake and artificial food, artificial manure, &c.	400	100	—						
Produce: hay, corn, potatoes, &c.	—	—	—	—	—	—	—	—	—
Farm labour	260	375	—	300	156	—	375	187	300
Rent	50	125	—	200	156	—	312	125	175
Horse and trap	250	50	—	—	30	—	50	50	50
Rates and insurance	30	25	—	40	30	—	40	12	16
Household expenses	—	—	—	—	—	—	110	—	—
	2,835	2,500	286	2,720	1,962	970	2,364	2,206	3,815

TABLE II.—*Showing the Estimated Average Annual Farm Revenue for the Quinquennial Periods 1872-77 and 1892-97.**

Average for Quinquennial Period	1872-77.	1892-97.
	£	£
Cattle	80,918,700	65,001,000
Sheep	42,370,500	29,794,000
Pigs	19,882,800	13,035,800
Poultry	6,625,000	7,500,000
Horses	3,203,000	3,957,000
Corn crops	55,885,000	23,560,000
Potatoes	18,728,000	10,274,000
Hay	10,735,000	7,800,000
Green clover, rye grass, &c.	800,000	700,000
Vegetables, fruit, flowers, hops, } flax, including the values of } fruit vegetables consumed in }	16,352,000	13,378,200
Total	255,000,000	175,000,000

* Extracted from "Transactions of the Highland and Agricultural Society of Scotland," 5th series, vol. x, pp. 346, 347, 378.

TABLE III.—*Estimates of Capital Employed on Farms in the Counties of Hampshire, Leicestershire, Lincolnshire, Monmouthshire, Norfolk, Somerset, Suffolk, Surrey, Sussex, Yorkshire (North, East and West Ridings) and Wiltshire.*

[In some cases the actual valuations are given.]

(1.) *Hampshire Farm.*

140 acres arable, 50 acres down pasture (sheep run), 16 acres pasture.

	£
Valuation of hay at market price; straw, chaff and fodder } at spending price; tillages, young seeds, and tenant right }	370
6 cart horses at 30 <i>l.</i>	180
10 heifers for straw yard at 9 <i>l.</i>	90
300 sheep for fattening at 35 <i>s.</i>	525
Implements and fixtures	230
Seed corn and other seeds	60
Half-year's rent	60
„ rates	5
„ labour	110
„ household expenses	75
Horse corn	35
Fowls for stock	5
	<u>1,745</u>

Per acre, 8*l.* 11*s.*

In this case there are no returns until the sheep are sold, so an estimate is made for household expenses, rent and labour.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(2.) *Hampshire Farm.*

200 acres grass, 200 acres arable.

	£	s.	d.
Valuation of tillages: hay at market price; straw, chaff and fodder at spending price; young seeds and tenant right	650	—	—
7 cart horses at 30 <i>l.</i>	210	—	—
Milk-cart pony	10	—	—
60 dairy cows at 13 <i>l.</i> 10 <i>s.</i>	810	—	—
2 bulls	30	—	—
250 sheep for fattening at 35 <i>s.</i>	437	10	—
Implements, fixtures, &c.	500	—	—
Nag horse for trade purposes	50	—	—
Seed corn and other seeds	70	—	—
Fowls for stock	5	—	—
	2,722	10	—

Per acre, 6*l.* 16*s.*

In this case as there is a large dairy return commencing at once, no estimate has been made for labour, household expenses, or rent.

(3.) *Estimate as to Capital Employed in a Farm of Good Mixed Soil of 250 Acres in North Leicestershire.*

100 acres arable, 150 acres grass.

	£
Ingoing valuation	320
5 cart horses at 25 <i>l.</i>	125
90 head of stock. Average cost of 10 <i>l.</i>	900
100 sheep at 48 <i>s.</i>	240
10 pigs at 30 <i>s.</i>	15
Poultry for stock	5
Carts, implements, machines, tools, harness, &c.	160
Seed corn	27
Clover and grass seeds, mangold and turnip seed	12
Corn for horses' keep (three months)	12
Artificial manure	25
Cake and artificial food (three months)	50
Farm labour (three months)	60
Horse and trap	50
Rates and insurance (half-year)	25
	2,026

Per acre, 8*l.* 2*s.*

The rent of a farm requiring this outlay would be 1*l.* per acre. The wage bill would be 1*l.* an acre on the whole.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(4.) *Valuation of Tenant Rights, Live and Dead Farming Stock, &c., on a Farm of 367 Acres on the Lincolnshire Wolds, made on 22nd September, 1904.*

71 acres pasture, 296 acres arable.		£	s.	d.
Tenant rights—				
Allowance for oil cake, feeding stuffs, and manure	}	104	19	2
Seed and labour				
Tenants' fixtures				
Live stock—				
16 horses—1 pony, 11 workers, 2 two-year olds, } 2 yearlings.....	}	429	—	—
58 cattle—1 bull, 25 cows, 32 young stock				
290 sheep—154 sheep, 136 lambs		556	16	—
12 pigs		43	8	—
Poultry (not included)			—	
Implements—Gears, tools, implements.....		348	4	—
Produce—Hay, corn unthrashed (the hay and straw } must be consumed on the premises, and manure left) }	}	617	4	9
Turnips		80	—	—
		<hr/>		
Furniture (including market cart)		2,992	11	11
		150	3	6
		<hr/>		
		3,142	15	5
		<hr/>		

Per acre, *Sl.* 11*s.*(5.) *Valuation of Tenant Rights, Live and Dead Farming Stock, on a Farm of 236 Acres in Lincolnshire, made 15th October, 1904.*

106 acres arable, 130 acres pasture.		£	s.	d.	£	s.	d.
Tenant rights—							
Fixtures	43	18	—				
Seed and labour	25	10	—				
Oilcake and manure.....	22	10	7				
		<hr/>			91	18	7
Live stock—							
5 horses				106	—	—	
47 beasts				539	—	—	
258 sheep				494	14	—	
11 pigs				23	10	—	
15 fowls				1	2	6	
Produce—							
Hay and straw, which must be consumed on } premises, and manure left	}	65	2	—			
Corn unthrashed							
Potatoes.....		313	3	—			
Turnips and mangold		21	—	—			
Turnips and mangold		31	12	—			
Implements, gears, tools, &c.		145	7	6			
		<hr/>			1,832	9	7
		<hr/>					

Per acre, *7l.* 18*s.*

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(6.) *Valuation on 6th April, 1904, of Tenant Rights, Live and Dead Farming Stock, &c., on a Farm of 220 Acres in Lincolnshire.*

156 acres arable, 64 acres pasture.

Tenant rights—	£	s.	d.	£	s.	d.
Fixtures	147	17	8			
Oil cake and manure	40	12	1			
Seed and labour	139	4	2			
	<hr/>			327	13	11
Live stock—						
14 horses (1 hackney, 9 workers, 2 two-year olds, } and 2 yearlings)				403	—	—
66 beasts (20 cows, 46 young stock)				600	15	—
218 sheep (165 in lamb ewes, 53 hoggets)				631	4	—
6 pigs				24	—	—
Poultry				5	19	3
Implements, tools, gears, &c.				224	15	6
Produce—	£	s.	d.			
Mangold	6	—	—			
Hay	6	2	6			
Corn	32	1	6			
Potatoes	11	1	—			
	<hr/>			55	5	—
				2,272	12	8
				<hr/>		

Per acre, 10*l.* 6*s.*7.) *Valuation on 6th April, 1904, of Tenant Rights, Live and Dead Stock, on a Farm of 256 Acres in Lincolnshire.*

219 acres arable, 37 acres pasture.

Tenant rights—	£	s.	d.	£	s.	d.
Tenant's fixtures	24	8	9			
Underdraining	19	5	8			
Seed and labour	189	6	—			
Oilcake and manure	94	7	2			
	<hr/>			327	7	7
Live stock—						
14 horses—1 pony, 9 workers, 2 two-year olds, } and 2 yearlings				431	—	—
54 beasts				564	—	—
82 sheep				243	6	—
22 pigs				57	17	—
Poultry				5	—	—
Produce—						
Coleseed	114	15	—			
Corn	123	1	6			
Potatoes	60	17	6			
Mangolds	10	—	—			
Hay	8	—	—			
	<hr/>			316	14	—
				1,945	4	7
Implements, tools, gears				277	17	11
				<hr/>		
				2,223	2	6
				<hr/>		

Per acre, 8*l.* 9*s.*

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(8.) *Estimate as to Capital Employed in a Farm of Good Mixed Soil Land of 250 Acres in Monmouthshire.*

From Mr. RICHARD STRATTON, Newport, Monmouth.

200 acres grass, 50 acres arable.

	£
Valuation of covenants, say	200
4 cart horses, average at 25 <i>l.</i> per head	100
50 bullocks at 10 <i>l.</i> per head	200
100 sheep at 30 <i>s.</i> per head	150
10 cows at 15 <i>l.</i> per head	150
40 pigs at 20 <i>s.</i>	40
Fowls for stock	5
Carts, implements, machines, tools, harness, &c.	100
Seed corn	20
Clover and grass seed	10
Corn for horse keep	80
Cake and artificial food	160
Farm labour at 30 <i>s.</i> per acre	150
Half-year's rent at 20 <i>s.</i>	125
Horse and trap for trade purposes	50
Rates, say	30
	<hr/>
	1,510

Per acre, 6*l.*

(9.)

1, UPPER KING STREET,

NORWICH,

30th January, 1905.

DEAR MR. PALGRAVE,

In reply to your letter of the 6th inst., I have been carefully considering the detailed estimate¹ you have sent me as to the capital required for a Norfolk farm of 250 acres.

So far as the various items are concerned, they are undoubtedly open to some discussion, though on the whole I consider them to be reasonably correct, but the ultimate conclusion arrived at, viz., that 8*l.* an acre is necessary for a tenant to possess who is about to start business in a 250 acre farm, is open to no question.

As a land agent of over thirty years' experience, this very matter has of course come before me again and again when I have had farms to let. In the early seventies we ourselves had a 200-acre farm, and there was a capital of from 10*l.* to 12*l.* an acre invested in it, which was then considered a proper sum for a man to have who had a good farm and farmed high. But in

¹ The detailed estimate referred to is the "Estimate as to Capital employed in a Farm of Mixed Soil Land of 250 acres in Norfolk or Suffolk."

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*

these later days, when things are to some extent cheaper and business is done more closely, there is no doubt that 8*l.* an acre is amply sufficient for the purpose.

I am,

Yours faithfully

R. H. Inglis Palgrave, Esq.,

JAMES B. FORRESTER.

Belton,

Great Yarmouth.

(10.) *Estimate as to Capital Employed in a Farm of Good Mixed Soil
Land of 250 Acres in Norfolk or Suffolk.*

200 acres arable, 50 acres grass.

	£
Valuation of covenants, say	400
12 cart horses, average at 25 <i>l.</i> per head	300
40 bullocks at 10 <i>l.</i> per head	400
200 sheep at 30 <i>s.</i> per head.....	300
4 cows at 15 <i>l.</i> per head	60
20 pigs at 20 <i>s.</i>	20
Fowls for stock	5
Carts, implements, machines, tools, harness, &c.	150
Seed corn	50
Clover and grass seeds	25
Corn for horse keep.....	100
Cake and artificial food	100
Farm labour at 30 <i>s.</i> per acre.....	375
Horse and trap for trade purposes	50
Half-year's rent at 20 <i>s.</i>	125
Rates, say	30
	<hr/>
Per acre, 10 <i>l.</i>	2,490

(11.) *Estimate as to Capital Employed in respect of 260 Acres of Mixed
Land in Somerset.*

	£
6 cart horses, average at 25 <i>l.</i> per head	150
Bullocks.....	750
Sheep	500
80 pigs	80
Fowls for stock.....	5
Carts, implements, machines, tools, harness, &c.	250
Seed corn	40
Clover and grass seeds	20
Corn for horse keep.....	50
Cake and artificial food	400
Farm labour, at 20 <i>s.</i> per acre	260
Horse and trap for trade purposes	50
Rent	250
Rates, say	30
	<hr/>
Per acre, 11 <i>l.</i> 6 <i>s.</i>	2,835

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(12.) *Another Estimate of Capital Employed on a Farm of Good Mixed Soil Land of 250 Acres in Suffolk.*

200 acres arable, 50 acres grass.

	£
Valuation of covenants	500
10 cart horses	250
30 bullocks.....	300
200 sheep	300
4 cows	60
20 pigs	30
Fowls.....	10
Carts, implements, machines, tools, and harness	200
Seed corn	50
Clover and grass seeds	25
Corn for horse keep	100
Cake and artificial food	100
Farm labour	375
Horse and trap.....	50
Half-year's rent	125
Rates	25
	<hr/>
	2,500

Per acre, 10*l.*(13.) *Estimated Value of Capital Employed on a Farm of 68 Acres in Suffolk.*

50 acres arable, 18 acres pasture.

	£	s.	d.
Live stock—			
3 head of horse stock at 15 <i>l.</i> per head	45	—	—
3 cows at 15 <i>l.</i> per head	45	—	—
3 head of young stock at 14 <i>l.</i> 10 <i>s.</i> per head	13	10	—
Pigs, fowls, &c.....	12	—	—
Implements, &c.—			
Carts, machines, tools and implements.....	50	—	—
Covenants—			
Growing crops, fallows, young layers, manure, } hay, &c.....	120	—	—
	<hr/>		
	285	10	—

Per acre, 4*l.* 4*s.*

Note.—The arable land is mostly heavy clay soil, most of it drained owner, and the pasture is of fairly good quality.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(14.) *Produce of this Farm (68 Acres) in 1904.*

<i>Cr.</i>			<i>Dr.</i>		
	£	s. d.		£	s. d.
By value of corn sold	44	19 6	To wages for labour, 1 man and 1 boy	61	9 -
By value of produce sold from 3 cows	21	10 -	To tradesmen's bills	11	19 11
By milk, butter, &c., used by family	8	10 -	To artificial foods purchased	8	15 -
By profit on 3 head of young stock, pigs, and fowls	25	- -	Rates	5	- -
			To cost of maintenance of family, exclusive of milk, &c., from farm, at 15s. a week	39	- -
	99	19 6			
Balance deficiency	26	4 5			
	126	3 11		126	3 11

Notes.—(1.) The cost of labour and of maintenance of family, viz., 100*l.* 9*s.* on 68 acres, or at the rate of 1*l.* 9*s.* 6*d.* per acre, is moderate.

(2.) About 28 acres of corn was grown, producing 48½ quarters, of which 29 quarters were sold; the remainder was used for seed and consumed by horses and stock.

(3.) Roots and hay all consumed by stock.

(15.) *Estimate as to Capital Employed in a Sussex Weald Farm of 250 Acres, Michaelmas Tenancy.*

About half grass and half arable.

	£
Tenant right valuation, say	550
8 cart horses at 25 <i>l.</i>	200
Horned stock say 50, average 10 <i>l.</i>	500
200 lambs at 30 <i>s.</i>	300
20 pigs at 20 <i>s.</i>	20
Poultry	10
Dead stock	200
One year's rent and rates, say	240
Labour—	
Carters	} One year..... 300
Stockman	
2 labourers	
Extra for harvest, &c.	
Corn for horses and spring corn for seed; cake, artificial, &c., and contingencies, say	400
	2,720

Per acre, 10*l.* 18*s.*

Note.—This would be a very well stocked farm; there are not many such, the ordinary tenant farmer rubbing along with considerably less capital. A man should have the amount above shown to start with, and be able to farm well.

WALTER LINTOTT,
Land Agent, Surveyor and Valuer,
Estate Offices,
Lewes, Sussex.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*(16.) *Sussex, South Eastern District, adjoining Romney Marsh, 250 Acres.*

70 acres arable, 80 acres marsh, 100 upland pasture.

About half of the upland pasture has been laid down during the last thirty-five years, and is very poor stuff.

	£
Valuation	200
4 cart horses at 25 <i>l.</i>	100
20 bullocks, various ages, average value 10 <i>l.</i>	200
20 bullocks, various ages, 1 younger than above, average value 6 <i>l.</i>	120
6 cows and heifers at 13 <i>l.</i> 6 <i>s.</i> 8 <i>d.</i>	80
100 ewes at 5 <i>l.</i>	250
2 rams at 5 <i>l.</i>	10
60 wethers at 40 <i>s.</i>	120
140 tegs at 30 <i>s.</i>	210
2 pigs at 30 <i>s.</i>	3
Fowls	10
Carts, &c., and hurdles	140
Seed corn	15
Clover and grass seeds	7
Corn for horse keep	25
Cake and artificial manure	100
Farm labour, 1 <i>l.</i> 5 <i>s.</i> per acre per annum, 12 <i>s.</i> 6 <i>d.</i> half-year	156
Horse and trap for trade purposes	30
Half-year's rent, 25 <i>l.</i> per acre	156
Rates	30
	<hr/>
	1,962
	£
Increase in value of 40 store beasts at 3 <i>l.</i> per head	120
Increase in value of 300 sheep at 9 <i>s.</i>	135
Pig and poultry	10
	<hr/>
	265
	<hr/>
	1,697
	<hr/>
Per acre, 6 <i>l.</i> 15 <i>s.</i>	

(17.)

DEWSBURY,

WEST RIDING, YORKSHIRE,

DEAR SIR,

16th January, 1905.

I beg to give you an estimate of the capital employed in a farm of about 100 acres in this neighbourhood. I may say in giving you this valuation I am giving you practically the actual figures of the capital employed by a farmer who left his farm last spring, and of which I had the management—

	£	s.	d.
Valuation of tenant right as per estate agreement	325	-	-
4 horses ..	120	-	-
27 head of cattle	370	-	-
Carts, implements, machines, tools, harness, &c.	120	-	-
6 pigs	30	-	-
Poultry	4	10	-
	<hr/>		
	969	10	0
	<hr/>		

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*

The division of this farm was 40 acres of arable and 60 grass, the rent of this farm averages 30s. per acre and the rates 6s. per acre, so you will see from the valuation that the farmers in this district are employing more than 10*l.* per acre for the stocking of their farms. You will notice that this farm was entirely a milk farm.

If you require any further information I shall be glad to give it you.

Yours faithfully,

ROBT. S. BALDEN.

(18.) *Estimate of Capital Employed in a Farm of Good Mixed Soil of 250 Acres in South Durham and North Yorkshire.*

200 acres arable, 50 acres grass.

Tenancy commencing 13th May. Right of entry to arable land in November previous. Out-going tenant has an away-going crop off one-third of arable land. Last year's manure left free of cost.

	£
Tenant right, on cake, &c.	50
Cost of ploughing, &c., before 13th May	50
8 cart horses at 35 <i>l.</i> each.....	280
30 cattle at 10 <i>l.</i> each	300
2 cows at 18 <i>l.</i> each	36
60 ewes and their lambs, 60s.	180
4 breeding cows at 80s. each	16
Fowls	5
Horse and trap	50
Carts, implements, tools, harness, &c.	300
Seed corn	20
Clover and turnip seeds	30
Seed potatoes.....	10
Corn for horse keep till after first harvest	10
Cake and other bought food	120
Artificial manures	70
A year's wages at 30s. per acre	375
A year's rent at 25s. per acre.....	312
A year's rates	35
Tradesmen's bill, blacksmith, &c.	10
Household furniture, &c.	100
	<hr/>
	2,359
Insurance	5
	<hr/>
Per acre, 9 <i>l.</i> 9s.	

CHRISTOPHER MIDDLETON,
Tare Terrace, Darlington.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*

(19.)

VANE TERRACE,
DARLINGTON,

14th January, 1905.

DEAR SIR,

In reply to yours of 5th January, it is very difficult to form an estimate as to the amount of capital employed in farming at the present time.

It used to be an axiom that the capital required for a farm should not be less than 10*l.* per acre, and considerably more than that sum is frequently employed. At the same time, there are many farms where the capital does not exceed 5*l.* per acre, and even less.

I have stuck to the proportion of arable land and grass that you have given, although that is not the usual proportion in this district, but I saw no reason to make any change.

The figures I give assume that all or most of the implements, harness, &c., are new; also that the tenant has the first year's rent and wages in hand, as owing to the time of entry and the fact of the outgoing tenant having one-third of the arable land for his going away crop, there would not be very much to sell for the first year.

I have made no provision for cost of living for the first year, as there would be small sales to provide for this.

Yours faithfully,

CHRIS. MIDDLETON.

R. H. Inglis Palgrave, Esq.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*

(20.) *Estimate as to Capital required by the Tenant of a Good Farm of 250 Acres, Medium Soil, in Yorkshire. Ludy-Day Entry (6th April).*

200 acres arable, 50 acres grass.

	£
Valuation of tenant right on entry, including awaygoing crop } when matured	500
8 cart horses	240
120 ewes in lamb	360
4 cows	65
20 bullocks and heifers	220
4 breeding sows or gilts	15
Poultry	7
Trap-horse, trap, &c.	50
Seed corn and seeds for root crops	35
Clover seeds	25
Implements, tools, harness	175
Corn for keep of horses	60
Cakes, meals, &c., and poultry corn	60
Manures for root crops	40
Manures for second crop corn (40 acres)	30
Half-year's labour bill at 25s. per acre per annum, the first } half of the year at 30s., the second half at 20s.; 250 acres } at 15s.	187
Half-year's rent	125
Half-year's rates	12
	<hr/>
	2,206

Per acre, 8*l.* 8*s.*

From JOHN B. SIMPSON,
Land and Tenant Right Valuer,
Bridlington, Yorks.

(21.)

HOLDERNESS AGRICULTURAL CLUB,
PARLIAMENT STREET,
HULL,
17th January, 1905.

DEAR SIR.

I have shown your letter of the 6th inst. to the President and one or two members of the above Club.

The estimate of the capital employed on a farm of 250 acres, 200 acres being arable and 50 grass, would, as to some of the items set out in your letter, vary considerably in the East Riding of Yorkshire.

TABLE III *Contd.*—*Estimates of Capital Employed on Farms.*

Dealing with the strong clay soil of Holderness, I should say that the valuation of covenants is too high. There will be 66 acres of following crop, and if the holding were all well farmed, possibly a further 100*l.* for compensation under the Agricultural Holdings Acts. Eight working horses 25*l.* per head or a little more would suffice. The holding would not carry 40 bullocks, 200 sheep, and 4 cows. The implements for so small a holding might be properly estimated at 1*l.* per acre. The other items appear to be reasonable. To put the matter very shortly, one might say that in the Holderness district it would have cost thirty years ago at least 10*l.* per acre to stock such a farm, and that to-day it would possibly be about 7*l.* per acre.

Yours faithfully.

J. F. ROBINSON.

(22.) *Wiltshire Farm, 650 Acres.*

350 acres arable, 50 acres water meadow and pasture,
250 acres down pasture sheep run.

	£	s.	d.
Valuation of hay at market price; straw and fodder } at spending price; tillages, young seeds; sanfoin } roots and tenant right.....	620	-	-
400 ewes of regular ages at 50 <i>s.</i>	1,000	-	-
150 ewe lambs at 35 <i>s.</i>	262	10	-
20 cows at 13 <i>l.</i> 10 <i>s.</i>	270	-	-
12 cart horses at 30 <i>l.</i> ..	360	-	-
Implements, &c.	400	-	-
Seed corn	100	-	-
Clover and grass seeds, &c.	27	-	-
Half-year's labour	300	-	-
Horse and trap for trade purposes	50	-	-
Half-year's rent	175	-	-
Rates	16	-	-
Horse keep (corn)	80	-	-
Fowls for stock.....	5	-	-
Cake for sheep	150	-	-
	3,815	10	-

Per acre, 5*l.* 17*s.*

In this case there are no returns until the wool is sold in July, except for milk sold from cows, and the profit on this is allowed for the household expenses.

DISCUSSION *on* MR. R. H. INGLIS PALGRAVE'S PAPER.

MAJOR CRAIGIE said the problem of determining the extent of agricultural losses during the last thirty years was, as Mr. Palgrave had pointed out, one of very great difficulty, and all those who had tried to handle it were well aware of this. They readily acknowledged therefore Mr. Palgrave's courage in acceding to the request he should deal with the question, and they welcomed his return to their discussions. The first points they had to discuss were how far Mr. Palgrave had justified his particular application of the index number he had constructed, and the sufficiency of Mr. Turnbull's calculations. He had certainly seen with a good deal of surprise some of the results arrived at by the application of the index number of price variations to the original calculations of that industrious estimator, and looking at the two estimates of the five or six years' values that Mr. Palgrave had contrasted, he was struck by the suggestion that so much of the drop in values was in the production from live stock. Under the head of cattle, in which term he understood to be included not only meat, but also dairy produce and hides, the explanatory table in the appendix showed a loss of 16,000,000*l.* between the two periods contrasted, another drop of 12,000,000*l.* in the annual produce of sheep—a good deal of that of course was wool—and a drop of 7,000,000*l.* under the head of pigs. These three items together made a total of 35,000,000*l.*, a larger total than the whole decrease, under the head of corn crops. That result gave them cause to think whether Mr. Turnbull's figures and the prices taken for the two periods could be relied on to prove this surprising conclusion? He should himself have expected to find the loss of grain values largely exceed the drop on animal produce; he fancied the results did not seem to agree either with Mr. Sauerbeck's annual index numbers for the prices of animal food, or the series of the somewhat similar "Economist" figures published only last Saturday. Obviously this estimate required a closer examination than could be given in debate, and was a question for calm statistical investigation. No doubt if Mr. Turnbull's elaborate figures were dissected in detail they would find some explanation. There was another question attaching to the use of this table, and that was whether they were really wise to take the year 1872 as the commencement of any comparison. If one drew the curve of the aggregate values of produce roughly, it would suggest that there was a period from 1872 to 1876 which was perhaps abnormal in the prices presented, and therefore it would have been better for the inquiry to have begun rather later or rather earlier. In the tables of farmers' capital they had new original data which he welcomed. These would, he thought, enable some closer discussion to be made of the subject than had yet been given to it. He had himself ventured upon an estimate in the year 1878, and Mr. Palgrave referred to the fact

that Sir James Caird's figure nearly coincided with his own given in that year. The coincidence was purely accidental, for Sir James Caird told him afterwards that he had arrived at his estimate of capital by a simple multiplication of so many years' rent, he believed it was six years, which was adopted, and this in the long run, he said, represented the capital on the farm. His own estimate, like Mr. Palgrave's, was the result of a number of individual inquiries from competent land agents and farmers as to what money a man would put into a farm of different types throughout the whole country. As the result of a very extensive examination that figure varied enormously, and even more widely than Mr. Palgrave suggested, from: 15*l.* or 16*l.* per acre in some highly cultivated farms in Great Britain, down to as little as 2*l.* or 3*l.* for exceptionally poor farms in Ireland. It was curious that the mean figure thus got was 8*l.* per acre nearly thirty years ago, and he confessed to feeling some hesitation as to whether the decline of capital was so great as suggested in the paper. On Sir James Caird's method of six times the gross rental, the aggregate would be about 312,000,000*l.* now, or about 6*l.* 10*s.* per acre. There had been no doubt a change in the character and form of the capital now required. Heavy and serious losses to individual persons had occurred, and he for one thoroughly sympathised with the loss which had fallen on many a ruined farmer and many a crippled landowner whose estate returned a largely decreased rental; but the places of those men who had fallen out of the ranks in the struggle with disaster had been taken by others, and the present money value represented by the live stock, the implements and the crops on the farms might not perhaps be so far below the old level. There had no doubt been a huge reduction in the actual value of the land used for agriculture, but he believed it was the mode of capitalisation adopted by Lord Milner in the tables he put before the Royal Commission, which gave the precise estimate before them, and it depended to a large extent on the small number of years' purchase applied in recent times to the gross rental of the farms. That was a very stormy subject, despite the high authority quoted, one over which a great deal of discussion had arisen, but on which it would not become him to enter.

Mr. SHAW LEFEVRE said that while admitting the ability and interest of Mr. Palgrave's paper, he must demur to some of the methods which he had adopted, mainly as regarded the comparison of prices between the years 1872-78 with those of the present time, upon which he founded his whole argument respecting the losses of landowners' and farmers' capital. Everybody knew that between the years 1872 and 1878 there was a very great rise in agricultural prices, and it did not seem to him fair to take those particular years and compare them with the present time in order to found an argument as to the losses of the persons concerned. If instead of taking those few years he had gone back ten years further, he would have found a very different state of things. In his calculation as to the value of land Mr. Palgrave had followed the Royal Commission

which reported in 1898. It was quite true that the Royal Commission expressed the opinion that the owners' capital was reduced by the appalling amount of 1,000,000,000*l.*; but it had always seemed to him that that calculation was grotesque and absurd, and founded upon a wrong basis. The majority of the Royal Commission made the calculation by taking the year 1875 and comparing it with 1893. They took in the first place the difference between the income tax assessment of the value of the land, which they found was a difference of 20 per cent., and then they multiplied the first valuation for the year 1875 by thirty years' purchase and for the year 1898 by eighteen years' purchase, and in making that calculation they no doubt arrived at a difference of a thousand millions (1,000,000,000*l.*). But if they had gone back a very few years, and made a comparison with, say, 1851-61 and the present time instead of finding so great a difference in the income tax assessment, they would have found the assessment very much the same. He would read the income tax assessment for England and Wales for the years 1852, 1862, 1872, 1875, 1882, and 1893:—

Year.	Assessment.	Year.	Assessment.
	£		£
1852.....	41,000,000	1875	51,000,000
'62.....	44,000,000	'82	48,000,000
'72.....	49,000,000	'93	40,000,000

From that it would be seen that the value of land had gone down to exactly what it was in the year 1852, and was very little less than it was in 1861. Again, was it fair to take the value of land in 1875 at thirty years' purchase and the value of land in 1893 at eighteen years' purchase? It was quite possible that some transactions in the purchase of land in 1893 or 1898 might have been as low as eighteen years' purchase, having regard to the uncertainty of the future; but, as everybody knew, since then the price of land had steadied very much and gone up again, and he believed he was right in saying that the average price of land at the present moment was certainly more than twenty-five years' rental. Again, in dealing with the question of the farmers' capital, the author had applied the same method of comparison—the years 1872-78 with the present time. Taking the two periods and comparing them together, Mr. Palgrave's conclusions were probably right; but again he would say it was not a scientific comparison to make. A farmer had been in possession of his land, say, from the year 1852 to the present time; at one time the value of the capital invested in his farm had increased, and at another time it had fallen. Could it be said that when the value of capital had increased he had made a permanent gain? The capital was necessary for the cultivation of his land, and he could not dispose of it; he must keep the same amount of stock, farming implements, machinery, and so forth. No doubt farmers who had bought in the interval and sold out again had got a smaller price on selling out, but farmers who had come in

at a low valuation, and therefore on excellent terms, were probably doing very well now from the very fact that they came in at a low valuation. But, both in respect of farmers and of owners, ought they not to consider that there was something on the other side? Farmers might have suffered depreciation of their capital and have got lower profits, and owners might have got lower rents, but the price of agricultural products was only one of the many things which had fallen. Everything practically had fallen in price, and both farmer and landowner paid less now for their food and for their clothing, and for all the implements they wanted, and that must be taken into account as well. But there was a class connected with agriculture (of which Mr. Palgrave had taken no notice whatever), the agricultural labourer, who had gained enormously by the fall in prices, and whose wages had everywhere increased in the last thirty or forty years, while food and everything else he required could be got for something like 30 per cent. less than formerly. Therefore in considering the position of agriculture they must also take into account the position of the agricultural labourer, and the fact that prices had fallen, and that these three classes of people had gained in one direction, though no doubt they had lost in another. He took it the loss to the country as a whole must be considered to be the difference in the produce of the land which was formerly cultivated as arable farms and was now laid down to grass. It was not very difficult to measure what that was. The effect of the agricultural depression had been that two and a half million acres of land, formerly arable, had been laid down in grass, and the difference in value of the produce was not very difficult to arrive at. He took it that, at the outside, it was not more than 3*l.* or 4*l.* an acre, and that multiplied by 2,500,000 acres was not after all a very considerable sum in comparison with the enormous benefit which the country had derived as a whole from the fall in prices, and from the fall in prices of all the produce imported for the food of the country, and for all the raw produce for its manufactures.

Mr. F. A. CHANNING, M.P., said that the point which was of special interest to him was the loss of profit and the loss of capital to the farmers. That was a matter to which, when he sat upon the Royal Commission, he gave very close attention, and it seemed to him a matter of very great importance. Mr. Wilson Fox, who rendered very great services to the Commission, went into the actual relation between the profits of farmers on very large farms and the rents of those farms; and instead of the profits during the depression bearing the proportion to rent assumed, in the assessment for income tax, he found, taking a very large number of farms, that the proportion of the farmer's profit to the rent was not as 1 to 2 or 3, but ranged from one-seventh down to one forty-ninth. Having regard to facts of that kind, which he assumed a careful statistician like Mr. Wilson Fox to have verified with sufficient care, it could not be assumed that Mr. Palgrave's figures as to the loss sustained by tenant farmers were exaggerated; and he would, in fact, be

inclined to believe that the loss might have been even greater. As Mr. Shaw Lefevre had said, there were undoubtedly a great many items of gain to the tenant farmer in the working of an agricultural holding in the last ten or twenty years, but the item of wages and labour had certainly not decreased, although changes in cultivation had diminished the actual number of labourers employed. One fact which had struck him very much in analysing closely the evidence of the Commission was that the cost of labour remained relatively the same, although the actual value of the produce was so much diminished, and the profit also was much diminished. He also found that although agricultural manures had on the whole declined in value, yet that item of a farmer's outgoings was also almost stationary in the accounts of well managed farms. Those facts were of great importance, although undoubtedly there was a set-off in other directions, the farmer having gained by the lowering of prices, as the labourer had gained immensely by the lowering of prices. In dealing with the economics of this question, the essential fact that ought to be borne in mind was that during the whole of this depression, as far as he could judge from very careful analyses of all the farming accounts brought before the Commission, there was an entire disproportion between farmers' profits and the rents levied in the greater portion of the country, representing not only a tremendous loss of profit from year to year, but also in the capital of tenant farmers. He was very much surprised by the figure Mr. Palgrave gave of the average capital used by the farmers per acre, and would have thought Major Craigie rather nearer the mark in giving the figure of *£*l. If there had been a diminution of capital to the extent represented by the figure of *£*6l., it was one of the most pregnant and important facts to which the attention of the practical man could be drawn.

Mr. J. W. SPEAR, M.P., said it was a debateable point how far they must extend sympathy to the farmer because of his nominal loss of capital. He would admit that generally the farmer held his capital year after year, and as he did not realise it, the actual loss did not become plain except in the case of people leaving a farm; but an argument of that kind would not tend to restore confidence, and it would not satisfy the shareholders of a limited liability company to be told, "though your capital has been reduced enormously you must recollect you have not realised it, and therefore there is not much to be alarmed at." As a practical farmer, farming nearly two thousand acres, he could personally testify to the fact, which he imagined few would venture to dispute, that the British agriculturist had had no interest on his capital for twenty-five years, only a bare livelihood in return for his labour, and that was a very serious state of things, the result of which had been to check enterprise and to cause farmers to reduce the labour employed, with the consequence of a reduced output of the native food supply. Turning to the question of the labourer, he rejoiced that the labourer's position to-day was very much better than it was, but there was only about half the number of labourers on the land

that there ought to be, and that was a bad state of things not only from the farmers' point of view but from the national point of view, and a menace to our social wellbeing. Where they were to get healthy men to replenish our towns in the next generation was a very serious question. He would not venture to suggest any artificial method, such as protection, in order to create a greater demand for people on the soil by artificially raising prices to the cost of the general community, but their chief hope must be in cordial co-operation between the landlord, the tenant, and the labourer. At the same time the State had a duty, and the only remedy he could see was to make it better worth while for men to stay in the rural districts. Everybody now recognised how important it was to restore agricultural prosperity and bring people back on to the land, and this was a matter in which he thought the State might be expected to take its share by reducing the burdens on the agricultural classes. Whether the decline had been greater or less in different parts, on the whole it had certainly been enormous, and no one could think that the agricultural classes ought to contribute so much, either in local rates or imperial taxes, as they contributed in more prosperous days. When the present basis of taxation was formed there was nothing but real property to draw the local rates from, but to-day there had grown up in the shape of personal property property far exceeding in value the real property in this country, and yet the holders of that personal property contributed practically nothing to the cost of the roads, the poor, and so forth, though the owner might live in the neighbourhood and enjoy the advantage of such things just as much as if he were the owner of real property. Not only was that condition of things unfair, but it tended to drive away capital from being invested in the development of the country and caused it to be invested in other countries, thereby escaping contribution. Take the case of two brothers who were left 1,000*l.* each; one of them invested his money in a farm, and was rated say 200*l.* a year, which at 4*s.* in the pound would be 40*l.* a year, while the other brother, a bank clerk, with a salary say of 150*l.*, invested his 1,000*l.* in foreign securities, and living in a house rated at 30*l.* a year, at the rate of 6*s.* in the pound, contributed 9*l.* a year. He ventured to say that of the two the bank clerk was better off, but the farmer paid 40*l.* a year to the local charges and he only 9*l.* That surely tended to injure our own country for the benefit of others. The real point to be kept in view was the importance of getting people back to the land and keeping them there in the interests of the Commonwealth.

Mr. PALGRAVE asked where Mr. Spear's farm, to which he referred in the course of his speech, was situated.

Mr. SPEAR said at Tavistock in Devonshire, and at Rainham in Essex.

Mr. S. ROSENBAUM said he would ask the meeting to leave for a moment the political questions that had been raised, and come back to what he considered the main subject of the paper: that

was not the results arrived at by Mr. Palgrave, but the method he had adopted, which was really a startling one. By taking the Board of Trade index numbers, Mr. Palgrave found the estimated value of the produce during the second period 1892-97 agreed with Mr. Turnbull's estimates if one started with Mr. Turnbull's estimates for the first period. The close agreement of the average revenue in each quinquennium between Mr. Palgrave's estimates and the direct estimates of Mr. Turnbull, appeared to him to have established the rule that the farm revenue from year to year was proportionate to the index number from year to year. That appeared to suggest what seemed paradoxical, that somehow or other the volume of the farm produce had remained the same throughout the whole period. The only variation was one of values, and that seemed to him to be a very startling result, when it was remembered that the numbers employed in agriculture had decreased so considerably, the arable area had diminished by something like 3,000,000 acres, and similarly with everything else in connection with agriculture. The agreement between the two sets of figures was very striking, and seemed to suggest that one could put up a chart or table giving the index numbers from year to year by tenths and the corresponding farm revenue for that year. On theoretical grounds he could not explain that result, which was a very remarkable one, and one to which he desired to draw the attention of the Meeting.

Rev. R. G. COPE said he came from the wilds of Yorkshire, where the farms ran from twelve and twenty acres upwards, and had often been in the same family for generations. There was difficulty encountered by the County Council and all others interested in framing measures for stopping the terrible depopulation of the land. In the particular census area in which he lived the population had gone down 15 per cent. or 20 per cent. in the last census period. Everything had been done that could be done to improve the agricultural methods of the so-called farmer. His cart might be seen going along labelled "So-and-So, Farmer," and was probably carting refuse, stones or coal for the Local Board or local manufacturers, whilst his daughters would either work in the mill or become school teachers or dressmakers, and his sons would work in the mill. The decrease of tillers of the soil that was going on was really very serious, and the struggle for existence was very bitter. Whatever else the figures showed, they certainly proved that times had been getting worse and worse for a very long period, of which there was undoubted evidence in the appearance of the people. The people in that neighbourhood were deserting the land for trade.

Mr. J. O. VINTER, J.P., said he agreed with everything that Mr. Shaw Lefevre had said. There were four interests which had been alluded to, and he was beginning to think, in listening to one speaker after another, that not one of these interests had lost anything. With regard to the landlord, it had been shown that, whilst rent was very high in the period from 1872 to 1878, it was very much lower some ten years previously, and was lower again

now, and therefore the present owner was the only one who could be said to have suffered any loss. If, however, he happened to have held land before prices were high, or his father before him, he did not quite see where the loss came in. With regard to tenant farmers, his impression was that whilst it could not be said that they had made fortunes, they had made sufficient profits. This was entirely borne out by his own practical experience of farming. The labourer, of course, had not lost; his position was vastly improved; he had not only received more in money, but he bought everything at a less price. With regard to farming generally, there was no indication that it was a bad business. If they took up the "Gazette," how many failures of farmers would they find? Some weeks there was not a single failure recorded. His own impression was that the depression was over-rated, and that the return from farming was all that could reasonably be expected, taking into consideration the healthy and pleasant life which the farmer enjoyed. Low prices had been very beneficial to the country as a whole.

Mr. R. H. REW thought that anyone who had been concerned with agricultural affairs during the past twenty or thirty years would be rather surprised by the last speech. He happened to know one or two people who lived in Cambridgeshire, and the expressions of opinion he had heard from them as to the profits of agriculture in that county differed very considerably from those which Mr. Vinter had put forward.

Mr. VINTER said he had kept very accurate accounts for seven years, and if Mr. Rew would like to see them, he would show them to him with pleasure. Farming his own land, he paid a bailiff practically what a tenant farmer could live upon, so he could not expect to show much profit, but he had always been able to obtain the equivalent of a fair rent and some percentage on his trading capital.

Mr. R. H. REW said he congratulated Mr. Vinter very cordially and would be interested in seeing his accounts. He had seen a great many farm accounts, and amongst them those of gentlemen who, like Mr. Vinter, had been so fortunate as to make a success of farming, but he was bound to say he had also seen many accounts which showed very different results by very capable men who also farmed in a large way. They seemed to have reached a *reductio ad absurdum* if the last speaker was correct, because it was said that if a landowner was in possession of his land although the value of it had fallen he was at no loss. But surely land was no good to anybody unless rent could be got for it, and if rents had been reduced the landowner must be worse off to the extent of that reduction. Speaking generally with regard to the paper, it seemed to him they had been talking a little at cross purposes owing to some ambiguity which naturally existed in the use of the word "loss." In some parts of the paper the word "loss" was applied to what might be termed the "turn-over" of the agricultural

industry, but he thought such a use of the word somewhat arbitrary. What one would like to know, but what he was afraid it was absolutely impossible to know, was, what was the loss by the reduction of profits made in farming? The reduction of the aggregate amount received during the year did not show to what extent profits had been reduced. He thought the truth lay in the direction indicated by Mr. Palgrave rather than in that indicated by the last speaker. But no figures could fully show the extent of agricultural losses. Supposing, for instance, the valuation of farmers' capital at a certain date, say thirty years ago, and the corresponding value of the present time were worked out, and it appeared that the capital was less, so far as visible capital was concerned, he thought it rather difficult to maintain there was very much less, he would not say in value or in price, but in amount. There was no indication of any diminution of live stock in the country; on the whole it had probably rather increased, and no one probably would say there were less implements, as the use of implements and machinery had certainly very largely increased; and those two items of visible capital, therefore, had not been materially reduced. But whatever the capital at two different dates might be, it was still to be remembered that during the period there might have been on many farms half a dozen different occupiers, each of whom had lost his capital which had been replaced by his successor. That was invisible loss, immeasurable loss, which no one could get at, and that loss might have been going on continuously, even although the valuations at the beginning and at the end of the period showed no reduction.

Mr. H. W. MACROSTY suggested that it would add considerably to the value of the statistics given showing the progress either of loss or profit in agriculture over a long period of time, if they could be divided locally. There had been a sharp division of opinion between the other speakers, and if he were to attempt to decide the matter solely by the district with which he was acquainted, he would decide entirely in favour of Mr. Vinter. Speaking of the south-west of Scotland, especially Wigtownshire, he knew of absolutely no case in which a farmer during the last twenty-five years had gone out of business otherwise than solely by his own personal fault. At one period, probably from about 1879 to 1882, had estimates been made that compared with some five or ten years before, there would have been a serious loss to the farmers, but that was because the concession in rents was halting behind the fall in the farmers' takings. When that was remedied, from that period down to now, so far as one had been able to judge by outward appearances and by one's intimate personal acquaintance with individuals and judging their style of expenditure and so on, there had been no loss other than the ordinary fluctuation of income. In other parts of Scotland the state of things was entirely different, and it seemed to him that a series of statistics, however useful they might be presented in the mass, would be infinitely more useful if they could be divided over different districts of the

country, so as to separate out the different classes of farms from one another, according to whether it was purely dairy farming or purely corn, or, as in the district he was speaking of, mixed farming. Farmers there had managed to keep their hold on things simply by being first-class business men; by starting creameries, and by giving up things that were showing themselves unprofitable and turning to those that were profitable.

MR. J. W. WILLANS said he was presiding at a small meeting a little while ago in Torquay, when a farmer who had come into the room asked to be allowed to say that he did not at all sympathise with all the talk about farmers not being able to make a profit. The gentleman was himself a practical farmer, and though he did not think he had 2,000 acres, he had he believed a substantial farm, and was perfectly content with the profits he was able to make from year to year. He said that he did that not by adhering to ancient methods and the production year after year of the same crops that he had been producing and his grandfather before him, but by mixed farming, improved methods, and by adapting the products of his farm to the requirements of the time and his surroundings. He had not been a diligent reader of Mr. Rider Haggard, but he was under the impression that in the contributions he had been making to one of the periodicals he had given illustrations over and over again of farmers in the same district and under the same landlord some of whom were merely struggling along, whilst others were clever enough to make a substantial living. He could not help thinking there might be something in the suggestion that farmers did not, as a rule, put quite as much intelligence, adaptation, and enterprise into their occupation as other men thought it necessary to put into their various businesses in order to make them profitable. He sympathised entirely with Mr. Spear's regret as to the loss of population from the country into the towns, but he did not know exactly how an alteration in our system of rating would keep young men and women in country life. The depopulation of the rural districts was being felt also in other countries. In one of the recent blue books issued by the Board of Trade it would be found that in Germany, and even in the United States, there was a continual diminution of the agricultural in proportion to urban population, that there was a continual set towards the towns.

MR. SPEAR wished to explain that he had said the average farmer made no interest. He quite admitted that in some parts of England it might be otherwise.

MR. GODFREY said that the variations in the points of view adopted in the discussion had no doubt been very great, but the main fact remained that agriculturists had lost a great deal, and though that Society was mainly concerned with the statistical methods rather than with the amount of losses, there seemed no doubt, despite the opinion of some speakers, as to the actual facts. It would not have been necessary to appoint two Royal Commissions

to inquire into agricultural depression had it not been certain that agriculturists had been very hard hit indeed. There were, however, some figures available to show that in certain cases agriculturists had succeeded in making a profit even in these comparatively bad times. He referred to some accounts of farms taken in hand when thrown up by the tenants contributed by Mr. Albert Pell to the "*Journal of the Royal Agricultural Society*" a few years ago.¹ These showed that, after allowing for expenses of management and rent, there were in several cases profits made varying from $3\frac{1}{2}$ to 11 per cent. on the capital employed. Then, in cases where farmers had lived on their farms for years, that fact showed that they had succeeded in maintaining an existence for themselves and families, though they might not have accumulated the large profits which accrued to persons engaged in some other pursuits. Reference had been made to the increase of pasture. That in itself would mean a diminution of labour, and the change had doubtless contributed to the migration of agricultural labourers to the towns.

Mr. N. L. COHEN said he could not pass, without a word of comment, the curious theory that there was no loss of capital value to those who do not happen to be sellers just at the time of depreciation. Everybody knew that this depreciation of capital value was mainly a reflex of the depreciation of the value of the yield of the land, and it was quite obvious that the loss experienced by the landowner or the land farmer had a close relation to the depreciation in the income obtainable from his holding. He wished also to say a word as to the suggestion of the enormous improvement in the condition of the classes labouring on the land. Their sense of satisfaction at that experience must be qualified by a feeling that this improvement had been by no means proportionate to the improvement in the condition of workers not engaged on the land; that consideration ought surely not to be left out of the account. In comparing the advance in wages and the conditions of life of English workers with those on the Continent, we were not sufficiently alive to the still more marked improvement that had occurred in the circumstances of Continental workers as compared with their condition at the beginning of the periods under review. It was now some twenty years since he had suggested a system of affiliated labour registries throughout the country, and to be in correspondence with similar organisations in some of our Colonies, with a view to facilitating the marketing of labour. He was glad that the authorities seemed now disposed to give attention to proposals more or less on the lines of that suggestion. Probably with these facilities, in lieu of the old hiring-fairs, to bring together those who needed employment and those who needed labour, as well as by bringing about more co-operation at least in the matter of purchasing appliances and the cheapening of transport, they might look for some alleviation of the present situation.

¹ "*Journal of the Royal Agricultural Society of England*," vol. lx, 1899, pp. 689—706.

Mr. PALGRAVE, in reply, said he was deeply obliged to those who had joined in this interesting discussion, and for the kind manner in which they had responded to the vote of thanks to him.

The discussion on the paper had lasted three times as long as the paper itself. This showed the interest that had been taken in it. Some twelve or fourteen gentlemen had been so good as to make remarks upon it, and the time at his disposal was so short that it was utterly out of his power to answer them all. He regretted that Mr. Shaw-Lefevre had left the room, as he desired to point out to him that in selecting the years 1872-78 as his starting point he had not done so with the intention of taking the years when prices were highest, but because they were the furthest back to which Mr. Turnbull's calculations enabled him to go. The basis Mr. Lefevre proposed to take for estimating agricultural losses was absolutely inadequate and devoid of any scientific foundation. It was true that there had been periods of low prices more than half-a-century ago. But the fact of their existence had no bearing on the great losses which agriculture had suffered within the last thirty years. He had endeavoured to keep his statement well within the amount of these. With regard to the two and a half million acres of land now added to what was occupied as pasture, most of that land, if not all of it, was in a most deplorable condition. It had not been really laid down as pasture, which was a most difficult and expensive process, and the grass grown upon it was exceedingly inferior. If Mr. Lefevre went over land of this description he would find that the crops produced and the cattle fed on it were very different and inferior in value to the crops it had borne before agricultural depression set in. He had referred to the position of the agricultural labourer. No doubt the individual labourer was better off than he had been, but the diminution in their number was so great that as a class they received less advantage from the land than formerly. Hence, as a class, the agricultural labourers were losers. They were still far from being paid as well as was desirable. He hoped that their labour would become more valuable, and that farmers would be able to pay them better for it, while receiving greater advantage themselves.

The number of those who had joined in the discussion was so great, and the subjects referred to so various, that he could not at that late period of the evening weary them by attempting to answer them all in detail, but he hoped that five or six of the gentlemen who had spoken, and particularly Mr. Macrosty, would agree to undertake a general survey of the agricultural condition of the country, each taking up a separate section and working out the details. The writing the paper on it had convinced him that no single observer could hope to give a correct statement for the whole country, but a small committee of persons with local knowledge, each dealing with his own district and working on a uniform plan, might arrive at very valuable results. He would be greatly pleased that some effort of that kind should follow upon the address he had given, as the information thus gained would be extremely valuable.

The following were elected Fellows of the Society:—

Arthur James Dyke.

Richard White, F.C.I.S.

MISCELLANEA

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I.—*International Statistical Institute. London Session,
31st July to 5th August, 1905.*

THE International Statistical Institute holds its tenth session in London during the summer of 1905, as the guest of the Royal Statistical Society. Founded in its present form on the occasion of that Society's Jubilee in 1885, the International Institute has carried on the more valuable features of the work of the older series of International Congresses established in the middle of last century as the result of the labours of the late M. Quetelet, and the interest he provoked among the leading statisticians of Europe, on the occasion of the Great Exhibition of 1851.

London will, not for the first time, be asked to show hospitality to the statisticians engaged in promoting the cause of international comparability of records of national facts and phenomena. The International Congress of 1861 was held in this metropolis, when the late Prince Consort lent effective patronage to the fruitful deliberations of the meeting. The advantages of closer international co-operation to those engaged in statistical studies were ultimately recognised by the formation of the present Institute in London in 1885, when Sir Rawson Rawson was called to its Presidential Chair, and the subsequent career of this body has been signalled by interesting meetings held at Rome, Paris, Vienna, Chicago, Berne, St. Petersburg, Christiania, Buda Pesth, and Berlin since that date.

The International Statistical Institute has rigidly limited the number of its members to a maximum of 200—the present total being about 170—and twenty-one States are now represented in its ranks by their foremost official statisticians and by the more distinguished students and leaders of statistical science.

The labours of the various sections of the Institute are primarily applied to comparing the work and methods of statistical inquiry in different States and under diverse conditions of national existence. The subjects dealt with, however, are not only theoretical, but include discussions by statistical experts of such practical subjects as Immigration and Emigration, Foreign Trade and Domestic Production, Import and Export Statistics, the Incidence of Customs Duties, and those problems of Demographic and Vital Statistics which bear directly upon the intensely important subjects of the birth-rate and national well being.

The specific items of business to be discussed at the Conference in London will be determined by the Governing Bureau of the International Institute. The Members of that body are the President of the Institute, Dr. Karl Theodor von Inama-Sternegg, President of the Austrian Central Statistical Commission, the three Vice-Presidents of the Institute, viz., M. Emile Levasseur of the Institute of France, Professor W. Lexis of the University of Göttingen, M. Nicolas Troinitsky, President of the Russian Statistical Council, with the veteran General Secretary of the Institute, Signor Luigi Bodio, Senator of the Kingdom of Italy and Commissioner-General of Emigration at Rome, and the Treasurer, Sir Alfred Bateman, K.C.M.G.

Among other well known statisticians who have already intimated their intention to submit contributions for discussion are MM. Yves Guyot, Raffalovich, and Neymarck of France, Guber of Austria, Ferraris of Italy, Körösi of Hungary, and Kiar of Norway. Delegates from the United States are also expected on this occasion. The English members of the Institute are as under :—

Honorary Members.—Lord Avebury, F.R.S. ; Mr. Francis Galton, F.R.S. ; Sir Robert Giffen, F.R.S. ; Viscount Goschen, F.R.S.

Ordinary Members.—Mr. J. A. Baines, C.S.I. ; Sir A. E. Bateman, K.C.M.G. ; Mr. J. Beddoe ; Right Hon. Charles Booth, F.R.S. ; Mr. A. L. Bowley ; Major Craigie, C.B. ; Mr. R. F. Crawford ; Professor Edgeworth ; Mr. A. Wilson Fox, C.B. ; Professor H. S. Foxwell ; Mr. F. Hendriks ; Mr. Wynnard Hooper ; Dr. J. Scott Keltie ; Mr. C. S. Loch ; Dr. Longstaff ; Sir J. Macdonell, C.B. ; Professor Alfred Marshall ; Mr. J. E. O'Connor, C.I.E. ; Dr. Ogle ; Mr. R. H. Inglis Palgrave, F.R.S. ; Mr. R. H. Rew ; Mr. H. Llewellyn Smith, C.B., and Dr. John Tatham.

The Royal Statistical Society has appointed a large and representative Committee to make arrangements for the reception of the Institute, and to collect the necessary funds for its suitable entertainment, as well as for the expenses of printing and organisation, which will be considerable. It is proposed to establish a guarantee fund, which it is estimated should not be less than 1,000*l.* in amount, and the Executive Committee will be glad to receive promises of financial support and offers of assistance from Fellows of the Society and others interested.

II.—*Note on the Distribution of Married Women in Relation to the Birth-Rate.* By Miss B. L. HUTCHINS.

THE following tables represent an attempt to elucidate the relation (for relation there must be), between the birth-rate and the percentage of women who are married at certain ages. Some attention has lately been drawn to the fact that the birth-rate of England and Wales, after reaching its highest known point in 1876, has since that date shown a steady downward tendency. In popular discussions of the subject it is generally assumed that the usual method of dividing the number of births $\times 1,000$ by the total population, results in a formula which represents the variations of the birth-rate from place to place, or from time to time, with sufficient accuracy. But Mr. H. G. Wells has pointed out¹ that this method, being based on a tacit assumption that the constituent elements of the population are always and everywhere the same, may lead to serious misunderstanding. The proportions of children, adults, and grown persons vary in a considerable degree from place to place, which is allowed for in correcting the crude death-rate, but the number and ages of married persons also vary from place to place and from time to time, which also has to be allowed for, if the changes and variations in the birth-rate are to be assigned their true significance. The following table shows the change in the proportion of women under age at their marriage, parallel with the movement of the birth-rate, in quinquennial periods:—

TABLE 1.—*Marriage and Birth-Rates, with the Proportions of Women who were Under Age on their Marriage Day. England and Wales.*

Period.	Persons Married per 1,000 Living.	Births per 1,000 Living Persons.			Marriages of Women Minors per 1,000 Marriages.
		Total.	Legitimate.	Illegitimate.	
1851-55 ...	17.2	33.9	31.7	2.2	—
'56-60	16.7	34.4	32.2	2.2	187
'61-65	16.8	35.1	32.9	2.2	199
'66-70	16.4	35.3	33.2	2.1	208
'71-75	17.1	35.5	33.7	1.8	223
'76-80	15.3	35.4	33.7	1.7	217
'81-85	15.1	33.5	31.9	1.6	215
'86-90	14.7	31.4	30.0	1.4	200
'91-95	15.1	30.5	29.2	1.3	183
'96-1900	16.1	29.3	28.1	1.2	168

It may possibly be objected that the figures relating to marriages of minors are not held to be absolutely reliable. Probably not, in detail: but it can hardly be contended that they do not roughly represent the course of a movement which, from other sources, we know to have taken place, viz., a gradual growth and expansion of trade, leading to high wages and a high proportion

¹ *Mankind in the Making*, p. 89, n.

of youthful marriages in the earlier seventies, followed by a rise in the standard of comfort and a growing tendency to postpone marriage till a later age. At the present time the birth-rate is usually high where the proportion of early marriages is high, and *vice versa* :—

TABLE 2.—*Marriages of Women Under Age and Birth-Rates in Counties, 1890-1900.*

	Marriages of Women Minors per 1,000 Marriages.			Birth-Rate.		
	1890-1900.	1901.	1902.	1891-1900.	1901.	1902.
Durham	249	229	226	35·8	36·2	35·9
Staffordshire	217	195	193	34·7	32·9	33·7
London	165	150	140	30·3	29·0	28·5
Sussex	133	135	122	24·0	22·6	22·1
Surrey	123	113	112	24·8	24·1	23·7
Rutland	123	144	116	23·8	22·9	21·9

In order to compare these figures with those given in the census, I have worked out the percentages of women married at different ages, for England and Wales, during the last half century, and for the town of Preston from 1861, the earliest census in which returns as to civil condition were given for towns.

In England the proportion of women married increased up to 1871, then steadily decreased to the present time; in Preston the decrease of early marriage is already perceptible in the decade 1861-71. The upward tendency in the proportions married aged 25—35 and 35—45 from 1861 to 1871 is, however, indirect testimony of a previous increase of early marriage, of which we have no record.

In Table 3 one feature is liable to misunderstanding, viz., the decrease in the proportion of women 15 to 45 who are married. It is true that the percentage of women 15 to 45 who are married is smaller than formerly, but the percentage of married women 15 to 45 to the total population is slightly larger, owing to the fact that the fall in the death-rate of adults has tended to increase that proportion of the population which is of mature years relatively to younger ones.

	Total Population.	Children Under 15.	Per Cent. of Total Popu- lation.	Women 15 to 45.	Per Cent. of Total Popu- lation.	Married Women 15 to 45.	Per Cent. of Total Popu- lation.	Percentage of Women 15 to 45 who were Married.
1871	22,712,266	8,202,041	36·1	5,239,755	23·1	2,600,768	11·5	49·1
1901	32,716,708	10,543,739	32·2	8,120,847	25·0	3,803,942	11·7	46·8

So far the decline of the birth-rate appears to be even greater than is indicated by the official figures, for the number of women in every 1,000 of population who are of an age and condition to have

TABLE 3.—*Percentage of Women Married, in Age-Groups, from 1851 to 1901.*
ENGLAND AND WALES.

	Women Aged 15 to 20.			Women Aged 20 to 25.			Women Aged 25 to 35.			Women Aged 35 to 45.			Total Women Aged 15 to 45.		
	Total.	Married.	Per Cent.	Total.	Married.	Per Cent.	Total.	Married.	Per Cent.	Total.	Married.	Per Cent.	Total.	Married.	Per Cent.
1851...	883,953	22,240	2.5	871,152	268,094	30.8	1,442,937	918,325	64.3	1,050,287	794,278	75.6	4,234,759	2,004,237	47.3
'61...	974,712	29,719	3.0	969,283	321,200	33.1	1,559,965	1,040,244	66.7	1,217,331	928,486	76.3	4,721,291	2,319,655	49.1
'71...	1,095,699	34,573	3.2	1,052,843	361,317	34.3	1,750,974	1,183,076	67.6	1,346,239	1,021,802	76.2	5,239,755	2,600,768	49.1
'81...	1,278,963	32,416	2.5	1,215,872	402,019	33.1	1,971,924	1,343,302	68.1	1,522,858	1,164,949	76.5	5,969,617	2,943,185	49.2
'91...	1,485,690	28,860	1.9	1,399,066	414,354	29.6	2,288,718	1,403,676	65.3	1,717,729	1,306,642	76.1	6,891,203	3,243,532	47.2
1901....	1,638,621	25,392	1.5	1,648,278	447,885	27.2	2,769,886	1,781,022	64.3	2,064,062	1,549,643	75.1	8,120,847	3,803,942	46.8

PRESTON.															
<i>Registration District.</i>															
1861...	6,214	188	3.0	6,509	2,089	32.1	9,515	5,769	60.7	6,787	4,829	71.1	29,025	12,875	44.4
'71...	6,064	133	2.2	5,813	1,776	30.6	9,814	6,038	61.2	7,356	5,259	71.5	29,047	13,226	45.6
'81...	6,940	134	1.9	6,846	1,925	28.1	10,560	6,437	60.9	8,528	5,950	69.8	32,874	14,446	43.9

<i>Urban Sanitary District.</i>															
1881...	5,401	117	2.2	5,269	1,571	29.8	8,036	5,086	63.3	6,499	4,603	70.8	25,205	11,377	45.1
'91....	6,076	118	1.8	5,855	1,697	29.0	9,409	5,847	62.2	6,909	4,890	70.9	28,249	12,552	44.4

<i>County Borough.</i>															
1901....	6,244	68	1.1	6,322	1,548	24.5	10,324	6,884	61.0	7,845	5,575	71.1	30,735	13,475	43.9

children is in 1901 somewhat greater than it was in 1871. When, however, we break up the total of these women into its component parts a much greater change is revealed. The proportion of women under 25 who are married is shown by Table 3 to have markedly decreased, and, as will appear from Table 5, it has also declined in proportion to population. The question occurs, how should this decrease be allowed for in estimating the fall of the birth-rate? Married women under 25 are not a large proportion of married women generally, but in this connection they probably have an importance over and above their numerical value, and any steady and consistent increase or decrease in their numbers might be expected to have a disproportionate effect on the total birth-rate. The question how much value should be given to this factor in correcting the "crude birth-rate" is a deeply interesting but most difficult question which I cannot pretend to discuss; the two sets of figures collated below will have served their purpose if they help to show the desirability of introducing some qualification of the kind.

Let us first turn for instruction to the variations of the birth-rate from place to place. Table 4 shows the birth-rate for England and Wales, and for two counties in which the birth-rate is comparatively high, two in which it is low. It also shows the proportion of married women under 25, and of all married women under 45, per 1,000 living persons of both sexes, and their excess or deficiency in each county mentioned, expressed as index numbers, taking the corresponding figures for the whole of England and Wales as 100:—

TABLE 4.

1901.	Total Population.		Married Women Under 25.		Married Women Under 45.	
Durham	1,187,474		23,599		146,167	
Staffordshire	1,236,919		20,569		148,375	
ENGLAND AND WALES }	32,716,708		473,277		3,802,942	
Surrey.....	653,549		6,921		72,398	
Sussex	602,255		6,284		62,980	

	Birth-Rate per 1,000 Population, 1891-1902.	Index Numbers.	Married Women Under 25 per 1,000 Population, 1901.	Index Numbers.	Married Women Under 45 per 1,000 Population.	Index Numbers.
Durham	35·8	120	19·9	137	123·1	106
Staffordshire	34·5	116	16·6	114	119·9	103
England and Wales (Mean) }	29·7	100	14·5	100	116·3	100
Surrey..	24·5	82	10·6	73	110·8	95
Sussex	23·7	80	10·4	72	104·6	90

It appears from this table that in each case excess or deficiency of the birth-rate above or below the mean coincides with an excess or deficiency both of married women and of young married women under 25. The difference between the birth-rates of Durham and Staffordshire on the one hand, and those of Surrey and Sussex on the other, consists therefore not so much in a difference in the proportion of children born to parents, as in a difference in the proportion of parents to population. It is also notable that the deviation of the proportions of young married women is greater than the deviation of the birth-rate, except in Staffordshire, and the deviation of the birth-rate is greater than the deviation of married women under 45. Now it is evident at once that wherever the percentage excess or defect of married women under 45 is less than the percentage excess or defect of the birth-rate, the one may be subtracted from the other with the object of bringing the birth-rate into relation not to the mere numbers of the population, but to the potential parenthood of different districts. In Table 4 every one of the variations of the birth-rate can thereby be reduced, and the deviations brought closer to the mean. We can then compare them with the proportion of young married women :—

	Variations of Birth-Rate Corrected for Proportions of Married Women Under 45.	Variations in the Proportions of Married Women Under 25.
Durham	114	137
Staffordshire	113	114
Surrey	87	73
Sussex	90	72

From this revised table it appears that Durham, with the highest crude birth-rate, is possibly the least prolific of the four, as the excess of young married women is greater than the excess of the birth-rate, and assuming the method to be sound, and the figures correct, the real order would be the exact reverse of the apparent one, the proportion of the birth-rate to young married women being greatest in Sussex, next greatest in Surrey, next in Staffordshire, and least in Durham. Or let us take an instance in which the deviation is much smaller. The birth-rate for Lancashire, 1890-1902, is 31.1, against 29.7 for England and Wales. We have then :—

	Birth-Rate.	Married Women Under 25 per 1,000 Population.	Married Women Under 45 per 1,000 Population.
England and Wales	100	100	100
Lancashire	105	108	105

Though the crude birth-rate of Lancashire is higher than that of England, the difference is only equivalent to the higher proportion of married women under 45. As the proportion of young married women is higher still, the real birth-rate of Lancashire is lower

than England's. It is probably safe to assume as a working hypothesis that, generally speaking, where an excess or defect of the birth-rate coincides with an excess or defect of married women is less than the excess or defect of young married women and greater than the excess or defect of married women under 45, the variation of the birth-rate is apparent rather than real and cannot be very far from the mean.

The next point is to consider whether the same qualifications can be applied in order to measure the difference between the apparent and the real decline of the birth-rate from one period to another. The difficulty is here much greater, as we have to rely on the figures of successive censuses, collected on varying principles, and in the case of the towns for different areas at different periods. Nevertheless, although no one would claim absolute accuracy for figures thus obtained, the attempt seems to me well worth making, as the results may be sufficiently clear to show not, perhaps, how much the decline of any local birth-rate precisely amounts to, but how the decline in one district compares with the decline in another.

Let us first compare the birth-rate in England and Wales during the past half century with that of two manufacturing towns, Blackburn and Preston. The birth-rate of England and Wales has already been given in Table 1, which shows that the highest quinquennial average occurred in 1871-75, 1876 being the culminating point of a gradual rise,² followed by a steady decline. The figures for Preston and Blackburn show a considerable degree of resemblance, but some differences:—

PRESTON. ³					
1851-55	41·5	1871-75	41·2	1896-1900	30·6
'56-60	41·1	'76-80	40·8	1901	30·2
'61-65	41·5	'81-85	37·3	'02	28·8
'66-70	42·3	'86-90	37·4	'03	30·2
(highest) }		'91-95	33·7		
Average, 1896 to 1903				30·3	

BLACKBURN. ³					
1851-55	42·5	1866-70	41·0	1886-90	35·4
(highest) }		'71-75	41·6	'91-95	31·7
'56-60	41·7	'76-80	36·7	'96-1903	27·5
'61-65	41·3	'81-85	37·7		

Both show a long period of high birth-rates, with a slight decrease after 1855, a marked rise at Preston in 1866-70, followed by a steady fall, and at Blackburn by a smaller rise, 1870-75, and a very abrupt fall. In either case it is interesting to see that these towns reached their highest point some years before England, and their birth-rates had already shown some signs of decline before that of the whole country. In the case of Preston, as we have already noted (Table 3), the percentage of young women married was also declining from 1861-71, and thence onwards, whilst the highest figure recorded for England was in the census of 1871; a

² It should of course be borne in mind that any rise in the earlier periods may be partially due to improved registration.

³ The figures are from the reports of the respective medical officers of health.

curious and unexpected instance of the well-worn saying, "What Lancashire does to-day, England will do to-morrow."

The method adopted in the following table is intended to bring out the relation between the diminution of early marriages and the diminution of the birth-rate. The fall of the birth-rate in England is taken from the highest quinquennium, 1871-75, to the last five years, 1899-1903, and the proportion of married women and young married women are given from the censuses of 1871 and 1901. As the highest point of the Preston birth-rate occurred in 1866-70, the fall is measured from that point, and the census of 1861 provides the figures for married women. For Blackburn the correct course would be to take 1851-55 as the starting point, but as the census gives no figures of civil condition at that date, I have taken the census of 1861, and the birth-rate averaged from the fifteen years 1861-75. By this method the importance of the fall of the birth-rate in relation to the decrease of young women married is considerably exaggerated, for in the case of the birth-rate the known highest and lowest points are taken; in the case of the census we can make no selection, and it is very probable, taking other well known facts into consideration, that there were more young women married in the years following 1871 than in that year itself. It should therefore be borne in mind that the modifications resulting from the table are the minimum, not by any means the maximum or probable maximum of allowances that might be made.

TABLE 5.
ENGLAND AND WALES.

	Total Population.	Married Women Under 25.	Per 1,000 Total Popula- tion.	Married Women Under 45.	Per 1,000 Total Population.	Highest Birth-Rate, 1871-75. Lowest Birth-Rate, 1899-1903.
1871	22,712,266	395,890	17·4	2,600,768	114·5	35·5
1901	32,716,708	473,277	14·5	2,803,942	116·3	28·7
Index numbers { 1861....	—	—	100	—	100	100
{ 1901....	—	—	83	—	102	81

PRESTON.

						Highest Birth-Rate 1866-70. 42·3 Lowest Birth-Rate, 1899-1903. 29·5
1861. (Registra- tion district).... }	110,523	2,277	20·6	12,875	116·5	
1901. (County borough)	112,989	1,430	14·3	13,475	119·2	
Index numbers { 1861....	—	—	100	—	100	100
{ 1901....	—	—	69	—	102	70

TABLE 5—*Contd.*

BLACKBURN.

	Total Population.	Married Women Under 45.	Per 1,000 Total Popula- tion.	Married Women Under 45.	Per 1,000 Total Population.	Birth-Rate 1861-75.
1861. (Registra- tion district) ... }	119,942	2,667	22·2	15,020	125·3	41·3
1901. (County borough) }	127,626	1,849	14·5	15,991	125·3	26·6
Index { 1861.... numbers { 1901 ..	—	—	100	—	100	100
	—	—	65	—	100	64

The *Times* recently remarked⁴ that the birth-rate has fallen more in the industrial districts than in other parts of the country, and it proceeded to draw conclusions and suggest explanations in which the decrease of early marriage among girls was not even mentioned. Table 5 shows that the birth-rate has certainly fallen more in the industrial towns of which the figures are analysed, but also that it has fallen from a greater height, and during a longer period of time, it has coincided with a greater diminution of early marriage, and that in the town where the fall of the birth-rate is most marked the diminution of early marriage is also intensified. Let us correct the fall of the birth-rate by the proportion of married women under 45 according to the method exemplified above, and then compare the corrected results with the diminution of young married women :—

	Fall of Birth-Rate, Corrected according to Proportions of Married Women Under 45.		Decrease of Married Women Under 25 in Proportion to Total Population.	
	1871.	1901.	1871.	1901.
England and Wales ...	100	79	100	83
Preston	1861. 100	1901. 68	1861-70. 100	1901. 69
Blackburn	100	64	100	65

In comparison with the decreased proportion of young married women the birth-rate has declined comparatively less (*pace* the *Times*) at Preston and Blackburn than in the whole of England and Wales, and, perhaps more curious still, it has declined comparatively less at Blackburn, where the crude birth-rate is lowest of the three, than at Preston, where it is highest. But let us take also the statistics of a town like Liverpool, where the birth-

⁴ 9th November, 1904, article on "Infantile Mortality."

rate appears to have fallen comparatively little. The decline starts from the quinquennium 1876-80, and the figures run thus:—

LIVERPOOL.—*Births per 1,000 Population.*

1876-80	38·7	1891-95	34·5
'81-85	37·0	'96-1903	33·3
'86-90	34·5		

Compare this fall with the change in proportions of women married:—

	Total Population.	Married Women Under 25.	Per 1,000 Total Population.	Married Women Under 45.	Per 1,000 Total Population.	Birth-Rate (Medical Officer of Health's Report).
1871. (Registra- tion district)	238,411	5,146	22·0	31,624	132·6	1876-80.* 38·7
1901. (County borough).....	684,958	12,419	18·1	85,193	124·4	1899-1903. 33·2
Index { 1871	—	—	100	—	100	100
numbers { 1901	—	—	82	—	94	86
Fall of birth-rate corrected for proportions of married women under 45						100 92

* Highest since 1861-65, which was also 38·7.

The real decline of the birth-rate is probably *nil*: but how does Liverpool stand in regard to the whole country? Is its birth-rate really higher? The crude birth-rate, 1899-1903, is 33·2.

	Birth-Rate.	Proportion of Married Women Under 25 per 1,000 Population, 1901.	Proportion of Married Women Under 45 per 1,000 Population, 1901.	Birth-Rate Deviation Corrected for Proportion of Married Women Under 45.
England and Wales.....	100	100	100	100
Liverpool	116	125	107	109

We thus find that the Liverpool birth-rate is 0·09 in excess of England's, but the town has actually one-fourth more young married women relatively to population, consequently its real birth-rate must be somewhat lower.

Another necessary qualification of which Mr. Wells has reminded us is the marked decline of the illegitimate birth-rate, which is now 1·2, against 1·8 in 1871, and 2·2 in 1861 (see Table 1). When allowance is made for this last factor, as well as for the smaller proportion of young wives, there may possibly still remain a margin of actual and real decline, which must be, however, considerably less than the decline of the crude birth-rate.

III.—*The Statistics of Wages in the United Kingdom during the Last Hundred Years.* (Part X.) *Engineering and Shipbuilding.*
A. Trade Union Standard Rates. By A. L. BOWLEY, M.A., and
 GEORGE H. WOOD.

THE tabulation of wages in the group of occupations comprised under engineering and shipbuilding is necessarily complex and extensive. We cannot proceed simply by division into districts or into industries (such as railway works, shipbuilding, &c.), or into occupations (such as blacksmiths, planers, &c.), for the information as to wages cuts across all these. It is doubtful on which of these methods it is best, in view of accuracy, to compile partial index-numbers; but it seems advisable to tabulate so far as possible on each of the systems, so that the grouping may be possible for all purposes. The complexity is increased by the very large number of different occupations in a modern engineering shop, a number which has grown during the century with every increase of specialisation, with every new utility found for iron or steel, and with successive inventions of machinery for carrying out such operations as boring, shaping and planing, &c.

The questions to be considered in this group of trades differ from those arising in the previous parts of this series. In agriculture, in building, and in printing, though the industries are scattered, the number of different occupations is small; the relative numbers engaged in each have undergone no revolutionary change, and the division by districts has, in the main, followed that of the distribution of country and town population respectively. In the woollen trades the number of separate occupations is great, and the relative numbers have changed considerably, but we have throughout the century to deal with only one principal locality. On the other hand, there are engineers in every town, and shipbuilders at every port; the various industries included have undergone revolutionary changes; the subdivision of labour has altered and developed in every decade; the chief centres of both shipbuilding and general engineering are now quite other than those in 1800. To say nothing of the railway works, the Tyne, the Wear, the Clyde, Belfast and Barrow are entitled to increasing weight, and Leeds, Manchester and Oldham, and many other great towns, have devoted a rapidly increasing part of their energy to general or specialised engineering.

It is proposed to deal with the subject in four parts. A. The trade union records and other consecutive records for engineering and shipbuilding; B. Other records for engineering; C. Other records for shipbuilding; D. Summaries and index numbers. In the present part are tabulated the principal standard rates, or minimum rates, recorded by trade unions. A great proportion of them are taken from the earlier Board of Trade reports on Trade Unions, of the Standard Time and Piece Rates, 1893 and 1900, and

Changes of Wages and Hours (annually since 1893); others come directly from the reports of various trade unions not published in any accessible form, others from the pamphlets and notes in the Webb Collection at the British Library of Political Science, others from private interviews and inquiries. It is believed that they are all genuine, and in the main comparable, but their exact relation to average wages is difficult to define, and may have changed. The statements are multitudinous, and in many cases provide continuous records over long periods; but there are many gaps both for places, occupations and years.

The principal existing trade unions¹ are the Amalgamated Society of Engineers, the Steam Engine Makers' Society, the United Pattern Makers' Association, the Friendly Society of Iron Founders, the Associated Iron Moulders (Scotland), and the United Society of Boilermakers and Iron Shipbuilders; but there are very many others of some importance. The Friendly Society of Iron Founders was founded in 1809, the Steam Engine Makers Society and the Provident Shipwrights in 1824, the Friendly Union of Mechanics, afterwards the Journeymen Steam Engine Makers and Millwrights, in 1826. The Associated Fraternity of Iron Forgers (Old Smiths), 1830, the Associated Iron Moulders, Scotland (1831), the United Society of Boilermakers and Iron Shipbuilders (1832), the United Machinist Workers (1866), the London Hammermen (1866), and the Co-operative Smiths (1869) are other unions founded at early dates which in one form or other still exist. In 1851 the Journeymen Steam Engine Makers developed into the Amalgamated Society of Engineers, uniting with several smaller societies for this purpose, and we depend for a great part of our information on the records of this important society.

The following brief statement shows the dates of the principal events in the annals of trade unionism which may be expected to have influenced wages. London Shipwrights succeeded in establishing a "price-book" after a strike in 1825. London Engineers obtained a 10-hours' day in 1836, followed by a further reduction of hours in 1844. In 1852 the newly formed Amalgamated Society of Engineers pronounced against piecework and overtime; a general lock-out of the Engineers resulted and the men were beaten. In 1859 the Greenock Shipwrights struck against a reduction of wages; in 1866 a general dispute on the Clyde resulted in the adoption of payment by the hour, and hours were reduced from 60 to 57 per week. In 1871-72 a wide-spread movement for a 9-hours' day was generally successful, 54 hours being adopted in England, 51 in Scotland. In 1877 the Clyde Iron Shipbuilders struck unsuccessfully for an advance of wages. In 1879 the hours in Scotland were increased to 54; in the same year wages were reduced in England, in spite of strikes, but the 54-hours' week was generally maintained. The Tyne Iron Shipbuilders

¹ Much of the following paragraphs is based on Webb's *History of Trade Unionism*.

struck again in 1886. In 1891 the hours on the north-east coast were reduced to 53. In 1897 occurred the Engineers' Lock-Out, nominally on the demand for an 8-hours' day, but actually on such questions as the limits of the right of combination and the general regulation of conditions of labour and of internal management. The result was a compromise, but the 8-hours' day was not, except in a few cases, permanently adopted.

The following table shows in some cases the maxima and minima, in other cases the so-called average of the weekly rates recognised by certain trade unions in their various branches, extracted from the Reports on Trade Unions:—

TABLE 1.—*Maximum and Minimum of the Standard Rates and Average Rates recognised by Trade Unions.*

AMALGAMATED SOCIETY OF ENGINEERS.							
	1851-62.	'63-65.	'66-70.	'71.	'72-78.	'79-81.	'82-90.
	s.	s.	s.	s.	s.	s.	s.
Maximum	34	35	36	36	36	36	38
Minimum	18	18	22	24	26	24	26

STEAM ENGINE MAKERS.										
	1853.	'57.	'64.	'72-73.	'74.	'79.	'82.	'85.	'90.	'92.
	s.	s.	s. d.	s.	s.	s.	s.	s.	s.	s.
Maximum	34	34	35 1	36	36	36	38	38	38	36, 38
Minimum	18	18	20 -	24	26	24	26	26	30	28

FRIENDLY SOCIETY OF IRONFOUNDERS.							
	1831-34.	'35-44.	'45-54.	'55-64.	'65-74.	'75-84.	'85.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Average (working full time)	25 6	26 3	27 6	29 -	31 6	33 -	31 6
„ (allowing for un-employment)	23 4	23 9	23 1	24 6	26 3	26 6	24 -

	1886.	'87.	'88.	'89.	'90.	'91.	'92-93.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Average (working full time)	30 9	30 10	32 10	34 5	35 6	35 6	35 -
„ (allowing for un-employment)	22 3	24 -	27 -	30 2	31 4	30 3	29 -

UNITED SOCIETY OF HOLDERS UP.				
	1880-83.	'84.	'85-87.	'88-90.
	s.	s.	s.	s.
Maximum	28	30	28	31
Minimum	22	24	22	24

TABLE I *Contd.*—*Maximum and Minimum Rates recognised by Trades Unions.*

CO-OPERATIVE SMITHS' SOCIETY.

Average rate of wages	1852.	A slow upward tendency to	'70.	'82-84.	'85-87.	'88.	'89.	'91.	'92.
	<i>s. d.</i>		<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
	22 6		25	33	30	33	35	36	35

ASSOCIATED IRON MOULDERS OF SCOTLAND.

Average rate of wages.....	1850.	'60.	'71.	'72.	'73.	'74-79.	'80-83.	'84-85.	'86-87.	'88.
	<i>s. d.</i>	<i>s.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
	27 6	29	35 7	32 11	30 9	32 4	31 6	34 10	31 6	34 10

ASSOCIATED BLACKSMITHS' SOCIETY.

Average rate of wages	1858-65.	'66-71.	'72-78.	'79-82.	'83-84.	'85-87.	'88-89.	1890.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s. d.</i>	<i>s. d.</i>
	23	25	27	28	30	28	29 6	31 6

ASSOCIATED SHIPWRIGHTS' SOCIETY.

Average rate of wages	1852-83.	'84.	'85-87.	'88.
	<i>s.</i>	<i>s. d.</i>	<i>s.</i>	<i>s. d.</i>
	33	31 6	30	31 1½

UNITED PATTERN MAKERS' ASSOCIATION (SCOTLAND).

Average rate of wages.....	1881.	'85.	'86.	'87.	'88.	'89.	'90.
	<i>s.</i>	<i>s.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s.</i>
	33	33	31 4	31 7½	32 9½	34 4	35

For comparison, and to save unnecessary duplication, it has appeared best to include with the trade union standard rates certain consecutive lists of wages, mainly those contained in *Returns of Wages* (C-5172). In recent years the rates stated by the employers' associations and by the trade unions are often identical; but as we go back we have less certainty that the standard rates were those actually paid, and the rates stated by the employers tend to differ from those recognised by the men's unions. Rates obtained from trade union sources are printed thus: 27*s.* 6*d.*, or 27*s.* 6*d.*, and rates from other than trade union sources are distinguished throughout by a special type, thus: 27*s.* 6*d.* When it is not otherwise stated,

the rates named are the standard minimum time wages for the normal week recognised by the trade unions concerned. Rates recognised alike by the associations of masters and men are thus printed: 27s. 6d., and rates given in the series of *Reports on Changes in Wages and Hours of Labour* are considered to be of this character, as all reputed changes are verified by application to employers and employed.² One of the chief difficulties in dealing with these industries is that of determining whether the rates stated are applicable to enginework or shipyard workers, or to both. Where possible, the rates for fitters and turners in shipyards are separated from those in engine shops, but this is not possible in many cases. As a general rule, however, where not otherwise stated, the rates are applicable to both classes of workers.

In Tables 2 and 3 is collected all the information of this kind relating to the north-east coast and the Clyde respectively. In Table 4 a separate tabulation is made of the boilermakers' wages, in spite of some duplication being involved, because of the homogeneity of this group. In compiling the table it was found that the sums of the changes shown in the *Annual Reports on Changes in Wages* were not consistent with the wages stated in the two *Reports on Standard Time Rates* (1893 and 1899); the plan adopted has been to work back from the 1899 rates, verifying the results obtained when possible. Except for a statement for 1873 in Edward Young's *Labour in Europe and America*, 1878, taken from the *Report of the Boilermakers' Society*, we have few statements previous to the *Standard Time Rates* volume in 1893. The *Report on Changes in Wages* for that year enables us to calculate the wage for 1892, and the Appendix to the *Report on Strikes and Lock-Outs*, 1892, gives us the means of taking some of the figures back to 1891.

Two other statements of value are:—

		1841.	1867.
		s.	s.
Riveters {	London	24	28
	Liverpool	28	30

The Webb Collection contains some rates for consecutive years for Belfast and other places, which are given in the various tables. The platers' and riveters' lists recognised on the Tyne and Wear are printed in the *Report on Standard Piece Rates*, 1893, with the changes from 1884. These agree with the statement of changes in piece rates for these places given in Table 2 (*b*).

In Table 5 is given the general tabulation for wages not included elsewhere. The order is neither geographical nor alphabetical, because of the exigencies of space, but the following index shows where statements relating to the various localities are to be found:—

² See the Report for 1898 [C-9431], p. xi.

	PAGES		PAGES
Aberdeen	118, 121, 137	Liverpool	108, 118, 126-8, 132, 136
Arbroath	137	London	108, 119, 122-4, 132, 136
Barrow	118, 121, 130	Londonderry	137
Belfast	121, 122-4, 130	Manchester	119, 134, 136
Birkenhead	118, 122-4	The Mersey	121, 132
Birmingham	118, 122-4, 130	Middlesborough	112
Blackburn	122-4	Monifieth	126-8
Bradford	122-4, 136	Newcastle-on-Tyne	109, 112, 126-8
Bristol	122-4	Newport	126-8
Cardiff	118, 130	Nottingham	126-8, 132
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The Clyde.....	115, 116, 121	Paisley	115, 116
Derby	122-4, 130	Portsmouth	119
Dublin	122-4, 136	Preston	120
Dundee	119, 121, 126-8, 132, 137	Sheffield	134, 137
Edinburgh.....	126-8, 137	Southampton	120, 134
Glasgow	115, 116	Stockton-on-Tees	112
Greenock	115, 116	Sunderland	109, 112
Halifax	132	Swansea	134
Hartlepool.....	109, 112, 114	The Tees	121
Hull	119, 121, 132	The Tyne	110, 112, 114, 121
Leeds	119, 132	The Wear	110, 114, 121
Leith	126-8	Wolverhampton	134

In Table 6 are collected the few miscellaneous statements for which room has not been found in the general tables.

TABLE 2 (a).—*Time Rates in Engineering and Shipbuilding. North-East Coast, 1823-71.*

	1823.	'24.	'58.	'59.	'60.	'62.	'65.	'67.	'71.
NEWCASTLE.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Shipwrights	24	27	24	30	30	—	—	—	—
Ironmoulders	—	—	—	—	—	—	26, 28	26, 30	—
Amalgamated Society of Engineers.....	—	—	—	—	—	25	—	26	24, 26

	1846.	'50-51.	'53.	'58.	'59.	'60.	'62.	'64.	'65.	'66.	'71.
SUNDERLAND.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Shipwrights	18	27	39	30	27	30	—	—	—	39	—
Shipjoiners	—	—	—	—	—	—	—	30	30	27	—
Amalgamated Society of Engineers.....	—	—	—	—	—	—	26	27	—	—	28

	1830-41.	'41-50.	'51-53.	'62.	'65.	'66.
HARTLEPOOL.	s.	s.	s.	s.	s. d.	s.
Shipwrights	15, 18	27	30	—	—	—
Shipjoiners	—	—	—	—	30 -	32
Amalgamated Society of Engineers.....	—	—	—	26	28 6	—

TABLE 2 (b).—Time and Piece Rates in Engineering

	1872.	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
TYNE SHIPYARDS. (a)												
Angle smiths { time	36	33	32	32	32	32	32	32	32	34	34	34
{ piece	—	—	—	—	—	—	—	100	107½	112½	112½	112½
Platers { time	36	33	32	32	32	32	32	32	32	34	34	34
{ piece	—	—	—	—	—	—	—	100	107½	112½	112½	112½
Riveters { time	30	32	32	32	32	32	32	32	32	33	33	33
{ piece	—	—	—	—	—	—	—	100	107½	112½	112½	112½
Caulkers { time	28	29	29	29	29	29	29	29	29	31	31	31
{ piece	—	—	—	—	—	—	—	100	107½	112½	112½	112½
Holders-up { time	28	26	26	26	26	26	26	26	26	27	27	27
{ piece	—	—	—	—	—	—	—	100	107½	112½	112½	112½
Blacksmiths { time	—	—	—	—	—	—	—	28	28	31	33	34
{ piece	—	—	—	—	—	—	—	100	107½	107½	112½	112½
Drillers { time	—	—	—	—	—	—	—	—	—	—	—	19
{ piece	—	—	—	—	—	—	—	100	107½	107½	107½	21
Platers' helpers	—	—	—	—	—	—	—	—	30	30	30	30
Angle smiths' strikers	—	—	—	—	—	—	—	—	31	6	31	6
Blacksmiths' "	—	—	—	—	—	—	—	—	32	—	32	32
Yard labourers	—	—	—	—	—	—	—	—	33	33	33	33
Fitters	—	—	—	—	—	—	—	—	23	23	23	23
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	33
Joiners	—	—	—	—	—	—	—	32	32	35	37	37
Plumbers	—	—	—	—	—	—	—	30	30	32	34	34
Painters	—	—	—	—	—	—	—	32	32	32	32	32
	—	—	—	—	—	—	—	28	28	28	28	28
TYNE ENGINE SHOPS.												
Fitters, turners	—	—	—	—	—	—	—	—	—	—	—	*
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Coppersmiths	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—
Shapers	—	—	—	—	—	—	—	—	—	—	—	—
Slotters	—	—	—	—	—	—	—	—	—	—	—	—
Screwers	—	—	—	—	—	—	—	—	—	—	—	—
Borers	—	—	—	—	—	—	—	—	—	—	—	—
Machine drillers	—	—	—	—	—	—	—	—	—	—	—	—
Plumbers	—	—	—	—	—	—	—	—	—	—	—	—
WEAR ENGINE SHOPS.												
Plumbers	—	—	—	—	—	—	—	—	—	—	—	—
TYNE BOILER SHOPS. (a)												
Angle smiths { time	36	36	38 6	38 0	38 0	38 0	37 6	37 6	37 6	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—
Heavy platers { time	34	36	39	38	38	38	38	38	38	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—
Light platers { time	34	34	37	37	37	36	35	35	35	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—
Riveters and time	32	31	34	33 6	33	33	32 6	32 6	32 0	—	—	—
Caulkers { time	—	—	—	—	—	—	—	—	—	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—
Holders-up { time	25	24	26	25 6	25 6	25 6	25	25	25	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—
TYNE FOUNDRIES.												
Iron and steel { time	—	—	—	—	—	—	—	—	—	—	—	—
{ piece	—	—	—	—	—	—	—	—	—	—	—	—

* See also Table 4 (a).

(a) The rate for angle smiths, platers, riveters, caulkers.

*and Shipbuilding. North-East Coast, 1872-1904.**

'84.	'85.	'86.	'87.	'88.	'89.	'90.	'91.	'92.	'93-95.	'96.	'97.	'98.	'99-01.	'02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
33	33	32	32	33 6	35 6	36 6	36 6	35	34	33 6	36 6	38	38	36 6	36 6
95	90	82½	82½	87½	97½	102½	97½	92½	87½	92½	97½	102½	102½	97½	97½
33	33	32	32	33 6	35 6	36 6	36 6	35	34	35 6	36 6	38	38	36 6	36 6
95	87½	80	80	85	95	100	95	90	85	90	95	100	100	95	90
31	31	30	30	31 6	33 6	34 6	34 6	33	32	33 6	34 6	36	36	34 6	34 6
100	95	90	90	95	105	110	105	100	95	100	105	110	110	105	100
31	31	30	30	31 6	33 6	34 6	34 6	33	32	33 6	34 6	36	36	34 6	34 6
95	90	85	85	90	100	105	100	95	90	95	100	105	105	100	95
25	25	24	24	25 6	27 6	28 6	28 6	27 6	26 7	28	29	30 6	30 6	28 6	28 6
100	95	95	95	100	110	115	110	105	100	105	110	115	115	110	105
31	31	31	31	32 6	34 6	35 6	35 6	34 6	33 6	35	36 6	38	38	36 6	36 6
102½	97½	92½	92½	97½	107½	112½	112½	102½	97½	102½	107½	112½	112½	107½	102½
18	20	20	20	21	23	24	24	23 6	23	23 6	25 6	25 6	25 6	24 6	24 6
20	22	22	22	23	25	26	26	25	24	24 6	25 6	26 6	26 6	25 6	25 6
95	100	100	100	105	115	120	120	110	105	110	115	120	120	115	110
27	26	25	25	26 3	29	30	30	28	27	28	29	30	30	29	29
28 6	28 6	27 6	27 6	29	32	33	33	31	30	32	33	34	34	33	33
29	29	27 6	27 6	29	32	33	33	31	30	32	33	34	34	33	33
21 6	21 6	21 6	21 6	22 6	23 6	24	24	23 6	23	24	25	26	26	25	25
—	—	—	18	18	19	19	19	20	20	20	21	21	21	20 6	20 6
32	31	31	31	33	35	36	36	35	32 6	34 6	36	37	37	37	36
34	34	33	33	34 6	37	38 6	38 6	37 6	36	37 6	39	40 6	40 6	39	39
32	32	31	31	32 6	35	36 6	36 6	35 6	35	36 6	38	39 6	39 6	38 6	38 6
32	32	32	32	32	34 6	34 6	34 6	34	33	34	35	36	36	36	36
28	28	28	28	29	31	32	32	31	31	32	33	34	34	33	33
—	—	—	30	32	34	35	35	33 6	31 6	33 6	35	36	36	35	35
—	—	—	32	34	36	37	37	35 6	33 6	35 6	37	38	38	37	37
—	—	—	—	—	—	36	36	34 6	32 6	34 6	36	37	37	36	36
—	—	—	—	—	—	38	38	36 6	34 6	36 6	38	39	39	38	37
—	—	—	—	—	—	34 6	34 6	33	31	33	34 6	35 6	35 6	34 6	34 6
—	—	—	—	—	—	36	36	34 6	32 6	34 6	36	37	37	36	36
—	—	—	—	—	—	21 6	21 6	21	20	22	23	23 6	23 6	23 6	23
—	—	—	—	—	—	37 6	37 6	36	34	36	37 6	38 6	38 6	37 6	37 6
—	—	—	—	—	—	21 6	21 6	21	20	22	23	23 6	23 6	23 6	23
—	—	—	—	—	—	31	31	29 6	28	30	31 6	32 6	32 6	31 6	31 6
—	—	—	—	—	—	21 6	21 6	21	20	22	23	23 6	23 6	23 6	23
—	—	—	—	—	—	32	32	30 6	29	31	32 6	33 6	33 6	32 6	32 6
—	—	—	—	—	—	23	23	22 6	21 6	23 6	24 6	25	25	24 6	24 6
—	—	—	—	—	—	29 6	29 6	28 6	27	29	30 6	31 6	31 6	30 6	30 6
—	—	—	—	—	—	20 6	20 6	20	19	21	22 6	22 6	22 6	22 6	22
—	—	—	—	—	—	30	30	29	27 6	29 6	31	32	32	31	31
—	—	—	—	—	—	21	21	20 6	19 6	21 6	22 6	23	23	22 6	22 6
—	—	—	—	—	—	29 6	29 6	28 6	27	29 6	30 6	31 6	31 6	30 6	30 6
—	—	—	30	32	34 6	34 6	34 6	33 6	33	34	35	36	36	36	36
—	—	—	32 6	32 6	36 6	36 6	36 6	33 6	33	34	35	36	36	36	36
—	—	—	30	32	33	34	34	33 6	33	34	35	36	36	36	36
—	—	—	30	32	33	34	34	33 6	33	34	35	36	36	36	36
—	—	—	33 6	35 6	37 6	38	38	36 6	34 6	36 6	38	39	39	39	38
—	—	—	100	107	109 6	110	110	105	100	105	110	112½	112½	112½	110
—	—	—	36	38	40	40 6	40 6	39	37	39	40 6	41 6	41 6	41 6	40 6
—	—	—	100	105	110	110	110	105	100	105	110	112½	112½	112½	110
—	—	—	34	36	38	38 6	38 6	37	35	37	38	39 6	39 6	39 6	38 6
—	—	—	100	105	110	110	110	105	100	105	110	112½	112½	112½	110
—	—	—	32	34 6	36 6	37	37	35 6	34	36	37	38	38	37	37
—	—	—	100	105	110	110	110	105	100	105	110	112½	112½	112½	110
—	—	—	26	28	30	30 6	30 6	29	27 6	29 6	30 6	31 6	31 6	30 6	30 6
—	—	—	100	105	110	110	110	105	100	105	110	112½	112½	112½	110
—	—	—	32	34	35	36	36	34 6	32 6	34 6	36	37	37	36	36
—	—	—	34	35	36	37	37	35 6	33 6	35 6	37	38	38	37	37
—	—	—	100	105	110	110	110	105	100	105	110	112½	112½	112½	110

and holders-up apply to the Wear also, from 1881.

TABLE 2 (b) *Contd.—Time and Piece Rates in Engineering*

	1872.	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.
NEWCASTLE.												
Shipjoiners (b)	s. d. 32 -	s. d. 34 -	s. d. 35 -	s. d. 35 -	s. d. 33 -	s. d. 33 -	s. d. 33 -	s. d. 31 -	s. d. 32 6	s. d. 33 6	s. d. 35 6	s. d. 35 6
Shipwrights	—	—	—	—	—	36 -	—	—	—	35 -	37 -	37 -
Engine Shops—												
Fitters	—	—	31 -	31 -	30 -	30 -	29 -	28 -	29 -	29 9	30 -	32 -
Turners	—	—	31 -	31 -	30 -	30 -	29 -	28 -	29 -	29 9	30 -	32 -
Smiths	—	—	—	—	—	—	29 -	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	—	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders	—	—	—	—	—	—	—	—	—	—	(+)	—
Amalgamated Soc. } of Engineers	30 -	—	32 10	—	—	—	—	29 -	—	—	—	—
TYNE.												
Plumbers (c)	28 -	28 -	29 6	29 6	32 6	32 6	32 6	31 6	31 6	33 -	33 -	33 -
Fitters (c)	28 -	28 -	28 -	28 -	28 -	28 -	28 -	27 -	27 -	28 -	29 -	29 -
	29 -	29 -	30 -	31 -	31 -	29 -	29 -	28 -	28 -	29 -	30 -	30 -
SUNDERLAND.												
Shipjoiners (d)	—	—	—	—	—	—	—	—	—	—	—	35 -
Shipwrights	—	—	—	—	—	36 -	—	—	—	—	—	—
Amalgamated Soc. } of Engineers (d)	—	—	34 -	—	—	33 -	(Fluctuations from				31s.	to 37s.
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
MIDDLESBOROUGH.												
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—
Shipwrights	—	—	—	—	—	36 -	—	—	—	—	—	—
Engine Shops—												
Fitters	—	—	33 -	33 -	33 -	33 -	31 {	30 6	30 6	30 6	33 -	33 -
Turners	—	—	32 -	32 -	32 -	32 -	30 {	29 6	29 6	29 6	32 -	32 -
Smiths	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—
HARTLEPOOL.												
Ship joiners (e)	—	—	—	—	—	—	—	—	—	—	—	—
Shipwrights	—	—	—	—	—	26 -	—	—	—	—	—	—
Ship fitters	—	—	—	—	—	—	—	—	—	—	—	—
„ turners	—	—	—	—	—	—	—	—	—	—	—	—
„ smiths	—	—	—	—	—	—	—	—	—	—	—	—
Engine Shops—												
Fitters	—	—	—	—	—	—	—	—	—	—	—	—
Turners	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—
Coppersmiths	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	—	—	—	—	—	—	—	—	—	—	—	—
STOCKTON.												
Shipwrights	—	—	—	—	—	36 -	—	—	—	—	—	—
Ship—												
Platers, piece	—	—	—	—	—	—	—	—	—	—	—	100
„ „ { piece	—	—	—	—	—	—	—	—	—	—	—	100
„ „ { time	—	—	—	—	—	—	—	—	—	—	—	27 -
Engine Shops—												
Turners	—	—	—	—	—	—	—	—	—	—	—	—
Fitters	—	—	—	—	—	—	—5%	—	+5%	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—

(b) 1893 35s. 6d., 1891-95 35s.

(c) Given to the Labour Commission by G. B. Cherry, representing the Operative Plumbers. The subject of the evidence was a dispute at Jarrow between fitters and plumbers. The rates are apparently for ship plumbers and engine shop fitters, and agree in the years 1872, 1877, 1883, 1887, 1892 with rates given by Capt. Noble, of Armstrong's, Newcastle. There was no uniform rate for plumbers until 1892.

and Shipbuilding. North-East Coast, 1872-1904.

'84.	'85.	'86.	'87.	'88.	'89.	'90.	'91.	'92.	'93-95.	'96.	'97.	'98.	'99-01.	'02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
32 - 32	31 - 31	31 - 31	32 6 - 35	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6	36 6 - 38 6
35 - 34	33 - 33	33 - 33	34 6 - 37	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6	38 6 - 38 6
32 - 32	30 - 30	30 - 30	33 6 - 34	34 - 34	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35
32 - 32	30 - 30	30 - 30	33 6 - 34	34 - 34	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	33 - 32	32 - 32	34 { 35 36 37 }	37 - 35 6	33 6 - 36 6	37 - 35 6	33 6 - 36 6	37 - 35 6	33 6 - 36 6	37 - 35 6	33 6 - 36 6	37 - 35 6	33 6 - 36 6	37 - 35 6	33 6 - 36 6
—	—	—	34 - 34	35 6 - 36	36 - 34 6	32 6 - 34 6	36 - 34 6	32 6 - 34 6	36 - 34 6	32 6 - 34 6	36 - 34 6	32 6 - 34 6	36 - 34 6	32 6 - 34 6	36 - 34 6
—	—	—	—	33 - 34	36 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35
—	—	—	—	33 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35
—	—	—	—	34 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35
32 - 31	30 6 - 30 6	30 6 - 30 6	30 6 - 34 6	34 6 - 34 6	34 6 - 34 6	34 6 - 34 6	34 6 - 34 6	34 6 - 34 6	—	—	—	—	—	—	—
28 - 28	28 - 28	28 - 28	28 - 28	28 - 28	28 - 28	28 - 28	28 - 28	28 - 28	—	—	—	—	—	—	—
29 - 29	29 - 29	29 - 29	29 - 29	29 - 29	29 - 29	29 - 29	29 - 29	29 - 29	—	—	—	—	—	—	—
32 - 32	30 6 - 30 6	30 6 - 30 6	32 - 34 6	36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 6 - 35 6	35 6 - 35 6	37 - 38 6	38 6 - 40	38 6 - 40	38 6 - 38 6	37 6 - 38 6
—	32 - 30 6	30 6 - 30 6	32 - 35 - 36 6	36 6 - 36 6	36 6 - 36 6	36 6 - 36 6	36 6 - 36 6	36 6 - 36 6	35 6 - 35 6	37 - 38 6	38 6 - 40	40 - 40	40 - 40	38 6 - 38 6	38 6 - 38 6
—	33 - —	—	—	(+ 2s.)	—	—	—	—	31 6 - 33 6	33 6 - 35 - 36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 - 35
—	—	—	—	33 - 35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	31 6 - 33 6	33 6 - 35 - 36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 - 35
—	32 - 30 - 31	34 6 - 36 6	37 6 - 37	35 - 33 6	31 6 - 33 6	33 6 - 35 - 36 - 36	37 - 38 - 38	37 - 38 - 38	35 - 33 6	36 6 - 37 - 38	38 - 40	40 - 40	40 - 40	38 - 38	38 - 38
—	31 - 29	29 6 - 31 - 33	33 6 - 37 - 38	38 - 38	37 - 38	38 - 38	37 - 38	37 - 38	35 - 33 6	36 6 - 37 - 38	38 - 40	40 - 40	40 - 40	38 - 38	38 - 38
33 - 33	31 - 31	30 6 - 32 { 33 34 }	34 - 33	31 6 - 33 6	33 6 - 35 - 36 - 36	37 - 38 - 38	37 - 38 - 38	37 - 38 - 38	35 - 33 6	36 6 - 37 - 38	38 - 40	40 - 40	40 - 40	38 - 38	38 - 38
32 - 32	30 - 30	29 6 - 31 { 32 33 }	32 - 32	31 6 - 33 6	33 6 - 35 - 36 - 36	37 - 38 - 38	37 - 38 - 38	37 - 38 - 38	35 - 33 6	36 6 - 37 - 38	38 - 40	40 - 40	40 - 40	38 - 38	38 - 38
—	—	—	—	—	—	—	—	—	31 6 - 33 6	33 6 - 35 - 36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 - 35
—	30 - 27	28 6 - 31 - 34 6	33 - 35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	—	—	—	—	—	—	—	—	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
31 - 31	29 6 - 29 6	31 - 35 - 36 - 38	36 - 38 - 38	37 - 38 - 38	37 - 38 - 38	37 - 38 - 38	37 - 38 - 38	37 - 38 - 38	35 - 33 6	36 6 - 37 - 38	38 - 40	40 - 40	40 - 40	38 - 38	38 - 38
—	—	—	—	33 6 - 35 - 35	35 - 35	35 - 35	35 - 35	35 - 35	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	—	—	—	33 - 34 6	34 6 - 33 - 32	33 - 32	33 - 32	33 - 32	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	31 6 - 31 6	—	—	33 - 34 6	34 6 - 33 - 32	33 - 32	33 - 32	33 - 32	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	—	—	—	34 - 35 6	35 6 - 33 - 32	33 - 32	33 - 32	33 - 32	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	—	—	—	32 - 33 6	33 6 - 32 - 31	32 - 31	32 - 31	32 - 31	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	32 - 30 6	32 7 - 34 8 1	37 1 - 37 6	36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
—	—	—	—	33 6 - 37 - 38	38 - 38	38 - 38	38 - 38	38 - 38	33 6 - 35 6	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37	37 - 37
82 1/2 - 88 1/2	75 - 88 1/2	67 - 84 1/2	67 - 84 1/2	72 - 94 1/2	82 - 105 1/2	87 - 109	87 - 109	82 - 104	77 - 99	82 - 104	87 - 109	92 - 114	92 - 114	87 - 109	87 - 109
24 - 24	23 - 23	23 - 23	23 - 23	25 3 - 27 9	28 9 - 28 9	28 9 - 28 9	28 9 - 28 9	27 9 - 27 9	27 - 27	28 - 28	29 - 29	30 - 30	30 - 30	29 - 29	29 - 29
—	—	—	—	—	—	—	—	—	31 6 - 33 6	35 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 - 35
—	—	—	—	—	—	—	—	—	31 6 - 33 6	35 - 36	36 - 36	36 - 36	36 - 36	36 - 36	35 - 35
—	32 - 31	32 - 32	32 - 32	33 - 34 6	36 - 36	36 - 36	36 - 36	34 6 - 33 - 32	35 - 35	36 - 36	36 - 36	36 - 36	36 - 36	36 - 36	36 - 36

(d) Fitters, turners, and smiths.

(e) 1893 33s. 6d., 1894-95 34s. 6d.

TABLE 2 (c).—*Time Wages of Boilermakers and Iron Shipbuilders. North-East Coast, 1891-1903.*

	1891.	'92.	'93-95.	'96.	'97.	'98.	'99-01.	'02.	'03-04.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
HARTLEPOOL									
WEST.*									
Boiler Shops—									
Angle smiths....	—	36 —	36 —	38 —	39 6	40 6	40 6	40 6	39 6
Heavy platers....	—	35 —	35 —	37 —	38 6	39 6	39 6	39 6	38 6
Rivetters.....	—	35 6	35 6	37 6	38 6	39 6	39 6	39 6	38 6
Caulkers.....	—	35 6	35 6	37 6	38 6	39 6	39 6	39 6	38 6
Holders-up.....	—	28 6	28 6	30 6	31 6	32 6	32 6	32 6	31 6
Ship Yards—									
Angle smiths....	—	36 —	35 —	36 6	37 6	39 —	39 —	37 6	37 6
Heavy platers....	—	36 —	35 —	36 6	37 6	39 —	39 —	37 6	37 6
Rivetters.....	—	32 6	31 6	34 —	35 —	36 6	36 6	35 —	35 —
Caulkers.....	—	32 6	31 6	34 —	35 —	36 6	36 6	35 —	35 —
Holders-up.....	—	27 —	26 —	27 6	28 6	30 —	30 —	28 6	28 6
THE TYNE.									
Boiler Shops—									
Angle smiths....	40 6	39 —	37 —	39 —	40 6	41 6	41 6	41 6	40 6
Heavy platers....	40 6	39 —	37 —	39 —	40 6	41 6	41 6	41 6	40 6
Light „.....	38 6	37 —	35 —	37 —	38 6	39 6	39 6	39 6	38 6
Rivetters.....	37 6	36 —	34 6	36 6	37 6	38 6	38 6	38 6	37 6
Caulkers.....	37 6	36 —	34 6	36 6	37 6	38 6	38 6	38 6	37 6
Holders-up.....	30 6	29 —	27 6	29 6	30 6	31 6	31 6	31 6	30 6
THE WEAR.									
Boiler Shops—									
Angle smiths....	41 —	39 6	37 6	39 6	41 —	42 —	42 —	42 —	41 —
Heavy platers....	41 —	39 6	37 6	39 6	41 —	42 —	42 —	42 —	41 —
Light „.....	39 —	37 6	35 6	37 6	39 —	40 —	40 —	40 —	39 —
Rivetters.....	37 6	36 —	34 6	36 6	37 6	38 6	38 6	38 6	37 6
Caulkers.....	37 6	36 —	34 6	36 6	37 6	38 6	38 6	38 6	37 6
Holders-up.....	31 —	29 6	28 —	30 —	31 —	32 —	32 —	32 —	31 —

* The iron shipbuilders were advanced 5 per cent. on piece rates and 1s. 6d. on time rates in 1888 and 1889.

This statement has been compiled from various sources, but the employers' statements, and those marked as recognised by employers and employes from 1880 to 1904 in the portion referring to the Tyne (and in shipbuilding, the Wear) generally have been compiled from an unpublished statement of changes in wages, 1880-1893, to be found in the Webb Collection, taken to 1904 by means of the *Reports on Changes in Wages and Hours*. Generally speaking, the changes at other places on the North-East Coast have followed the Tyne, but the rates are different. The differences are less now, however, than formerly, and a tendency towards uniformity (for the same occupation) is noticeable (*e.g.*, plumbers and shipwrights).

TABLE 3.—*Time Wages in Engineering and Shipbuilding. Clyde.*

	1793.	1810.	'11-14.	'15-16.	17-19.	'20.	'21-23.	'24.	'25-27.	'28-29.	'30.	'31.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
THE CLYDE.												
Shipwrights	—	—	—	—	—	—	—	—	—	21 -	21 -	21 -
GLASGOW.												
Mechanics	12 -	19 -	19 -	19 -	19 -	19 -	— { ²⁴ ₂₅ —	—	—	—	—	19 -
Turners	—	—	—	—	—	—	—	—	—	—	23 6	23 6
Ironmoulders	—	—	—	—	—	—	—	—	—	—	26 -	26 -
Patternmakers	—	—	—	—	—	—	—	—	—	—	21 6	21 6
Brassfounders	—	—	—	—	—	18 5	18 5	18 5	18 5	18 5	19 -	19 -
Smiths	—	14 -	15 -	16 -	17 -	17 -	—	—	—	—	18 -	18 -

	'32-35.	'36.	'37.	'38.	'41.	'44.	'47.	'50.	'51.	'52.	'53.	'54.	'55-56.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
THE CLYDE.													
Shipwrights*	21 -	21 -	21 -	21 -	21 -	—	21 -	—	21 -	21 -	30 -	30 -	—
Shipwrights	—	—	—	—	—	—	—	24 -	24 -	24 -	24 -	24 -	27 -
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—	—
GLASGOW.													
Mechanics	—	22 -	— { ²⁰ ₃₀ —	— { ²² ₂₈ —	—	—	—	20 7	21 1	23 -	23 6	24 -	—
Turners	23 6	—	—	23 6	—	—	—	—	—	—	—	—	—
Ironmoulders	26 -	—	—	26 -	—	—	—	—	—	—	—	—	—
Patternmakers	21 6	—	—	21 6	—	—	—	—	—	—	—	—	—
Brassfounders	19 -	—	—	20 -	—	—	—	—	—	—	—	—	—
Smiths	18 -	—	—	18 -	—	—	—	—	—	—	—	—	—

	'57.	'58.	'59.	'60-61.	'62.	'63.	'64.	'65.	'66.	'67.	'68-69.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
THE CLYDE.											
Shipwrights*	23 4	24 -	24 -	24 -	27 -	30 -	36 -	30 -	30 -	25 8	25 8
Shipwrights	—	—	—	—	—	—	—	36 -	—	25 8	—
Shipjoiners	27 -	26 -	26 -	—	26 -	26 -	27 -	28 -	28 -	26 1½	26 1½
GLASGOW.											
Mechanics	23 11	23 6	—	—	—	—	—	—	—	—	—
Patternmakers ..	—	—	—	—	—	—	—	—	—	—	—
Coppersmiths ..	—	26 -	—	—	—	—	—	—	—	—	—
Amalgamated Soc. of Engineers—											
Glasgow	—	—	—	—	23 6	—	—	—	—	—	—
Greenock	—	—	—	—	24 -	—	—	—	—	—	—
Paisley	—	—	—	—	24 6	—	—	26 -	—	—	—

* Statement of Mr. J. Scott, at the Clyde Shipwrights' Arbitration, 1877. The rates were not challenged by the men. The discrepancies in the years covered by this and the Trade Union Statement seem to be only due to different parts of the year being meant. The employers' statement refers to the end of the year, and there were two or three changes in some years.

TABLE 3 *Contd.*—*Time Wages in*

	1870	'71.	'72.	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.
THE CLYDE.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Shipwrights ... {	25 8	28 6	30 4	31 10	34 -	31 10	29 9	29 9	—	28 7½	29 3	—	31 6	33 9	36 -	33 9	30 4½	31 6
Shipjoiners	27 -	27 6	30 -	30 -	32 -	30 -	29 -	29 -	29 -	27 -	29 3	31 6	31 6	32 7½	29 3	28 1½	28 1½	28 1½
GLASGOW.																		
Fitters and } turners }	—	—	—	—	27 -	27 -	27 -	27 -	27 -	27 0	27 0	28 1½	28 1½	28 1½	28 1½	28 1½	29 3	29 3
Ironmoulders ...	—	—	—	—	(fell 7 ½ per cent.)	—	—	—	—	31 6	33 9	33 9	33 9	34 10½	31 6	30 4½	30 4½	30 4½
Patternmakers ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30 -	29 -	30 -
Brassfounders ...	—	—	27 8½	—	—	—	—	—	—	—	—	—	(+)	—	—	—	—	—
Strikers	27 -	27 -	27 -	28 -	29 -	29 -	29 -	28 -	27 -	27 -	30 -	29 -	30 -	30 -	30 -	30 -	29 -	29 -
Coppersmiths ...	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 6	18 6	18 6	19 -	18 6	18 -	18 -	19 -
Boiler Shops—	—	—	36 1½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Angle smiths }	—	—	—	30 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Heavy platers }	—	—	—	32 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Light „ ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riveters and caulkers }	—	—	28 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holders-up ...	—	—	17 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ship yards—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Angle smiths... {	—	—	{ 35 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Platers {	—	—	{ 39 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riveters and caulkers }	—	—	{ 34 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holders-up ... {	—	—	{ 35 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Amalgamated Society of Engineers—	—	—	{ 30 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Glasgow {	—	—	{ 30 6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Greenock {	—	—	{ 18 -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paisley {	—	—	{ 19 -	—	—	—	—	—	—	—	—	—	—	—	—	28 6	—	—

Engineering and Shipbuilding. Clyde.

'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99.	1900.	'01.	'02.	'03.	'04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
31 6	36 -	36 -	36 -	34 10½	33 9	33 9	33 9	36 -	37 1½	38 3	38 3	38 3	38 3	38 3	37 1½	37 1½
29 3	32 7½	33 9	33 9	32 7½	33 9	33 9	33 9	36 -	37 1½	38 3	38 3	38 3	38 3	38 3	37 1½	37 1½
29 3	30 4½	30 4½	30 4½	30 4½	30 4½	30 4½	30 4½	33 9	34 10½	36 -	36 -	36 -	36 -	36 -	35 -	35 -
32 7½	34 10½	36 -	34 10½	34 10½	34 10½	34 10½	34 10½	37 1½	37 1½	38 3	39 4½	39 4½	38 3	38 3	38 3	38 3
31 6	36 -	36 -	35 -	34 6	34 -	34 -	34 -	36 -	37 1½	38 3	38 3	38 3	38 3	38 3	37 1½	37 1½
-	31 6	31 6	-	-	32 7½	32 7½	32 7½	34 10½	36 -	37 1½	37 1½	37 1½	37 1½	37 1½	36 -	36 -
30 -	31 -	31 -	32 -	33 -	34 6	33 6	35 6	35 6	36 6	37 6	37 6	37 6	37 6	37 6	36 6	36 6
19 6	19 6	20 -	20 -	21 -	20 -	21 -	21 -	21 -	-	-	-	-	-	-	-	-
-	-	-	-	-	33 9	33 9	33 9	36 -	37 1½	38 3	38 3	38 3	38 3	38 3	37 1½	37 1½
-	-	-	-	-	39 -	37 10½	37 10½	39 4½	39 4½	41 7½	41 7½	41 7½	41 7½	41 7½	39 4½	39 4½
-	-	-	-	-	40 3	39 1½	39 1½	41 7½	41 7½	43 10½	43 10½	43 10½	43 10½	43 10½	41 7½	41 7½
-	-	-	-	-	39 -	37 10½	37 10½	39 4½	39 4½	41 7½	41 7½	41 7½	41 7½	41 7½	39 4½	39 4½
-	-	-	-	-	40 3	39 1½	39 1½	41 7½	41 7½	43 10½	43 10½	43 10½	43 10½	43 10½	41 7½	41 7½
-	-	-	-	-	36 9	35 7½	35 7½	37 1½	37 1½	39 4½	39 4½	39 4½	39 4½	39 4½	38 3	38 3
-	-	-	-	-	39 -	37 10½	37 10½	39 4½	39 4½	41 7½	41 7½	41 7½	41 7½	41 7½	39 4½	39 4½
-	-	-	-	-	34 6	33 4½	33 4½	34 10½	34 10½	37 1½	37 1½	37 1½	37 1½	37 1½	36 -	36 -
-	-	-	-	-	36 9	35 7½	35 7½	37 1½	37 1½	39 4½	39 4½	39 4½	39 4½	39 4½	36 6	36 6
-	-	-	-	-	24 4½	-	23 3	25 6	27 -	27 -	29 3	29 3	29 3	29 3	28 1½	28 1½
-	-	-	-	-	32 10½	31 9	31 9	31 9	33 9	33 9	36 -	36 -	36 -	36 -	36 -	36 -
-	-	-	-	-	32 10½	31 9	31 9	31 9	33 9	33 9	36 -	36 -	36 -	36 -	36 -	36 -
-	-	-	-	-	30 7½	29 6	29 6	29 6	31 6	33 9	33 9	33 9	33 9	33 9	33 9	33 9
-	-	-	-	-	22 9	21 7½	21 7½	21 7½	23 7½	23 7½	25 10½	25 10½	25 10½	25 10½	25 10½	25 10½
-	33 9	33 9	31 6	30 4½	30 4½	30 4½	30 4½	33 9	34 10½	36 -	36 -	36 -	36 -	36 -	35 -	35 -
-	31 6	33 9	33 9	32 7½	32 7½	32 7½	32 7½	33 9	34 10½	36 -	36 -	36 -	36 -	36 -	35 -	35 -
-	30 6	31 6	31 6	-	30 -	30 -	30 -	33 -	33 -	34 -	35 -	35 -	35 -	35 -	34 -	34 -

TABLE 4.—Time Wages of Boilermakers and Iron Shipbuilders.

	1873.	'89.	'90	'91.	'92	'93-95.	'96.	'97	'98.	'99-01.	'02.	'03-04.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
ABERDEEN.												
Boiler—												
Angle smiths...	—	—	34 3	34 3	33 3	33 3	34 3	34 3	36 3	36 3	36 3	36 3
Heavy platers	—	—	33 3	33 3	32 3	32 3	33 3	33 3	35 3	35 3	35 3	35 3
Light "	—	—	32 3	32 3	31 3	31 3	32 3	32 3	34 3	34 3	34 3	34 3
Caulkers	—	—	32 3	32 3	31 3	31 3	32 3	32 3	34 3	34 3	34 3	34 3
Ship—		'83.*										
Angle smiths...	—	31 6	30 3	30 3	29 3	29 3	30 9	30 9	32 9	32 9	32 9	32 9
Heavy platers	25 -	31 3	30 3	30 3	29 3	29 3	30 9	30 9	32 9	32 9	32 9	32 9
Light "	—	—	30 3	30 3	29 3	29 3	30 9	30 9	32 9	32 9	32 9	32 9
Riveters	24-25	29 -	28 9	28 9	27 9	27 9	29 3	29 3	31 3	31 3	31 3	31 3
Caulkers	24 -	29 -	28 9	28 9	27 9	27 9	29 3	29 3	31 3	31 3	31 3	31 3
Holders-up	19 -	20 -	21 -	21 -	20 -	20 -	20 10	20 10	22 10	22 10	22 10	22 10
* From Returns of Wages. There was a rise of 2s. in 1888.												
BARROW-IN-FURNESS.												
Boiler*												
Angle smiths	36-38	—	—	—	39 -	39 -	41 -	42 6	43 6	43 6	43 6	42 6
Heavy platers	34-36	—	—	—	36 11	36 11	38 11	40 5	41 5	41 5	41 5	40 5
Light "	—	—	—	—	36 11	36 11	38 11	40 5	41 5	41 5	41 5	40 5
Riveters	32-39	—	37 3	36 -	34 5	34 3	36 3	37 3	38 3	38 3	38 3	37 3
Caulkers	—	—	—	—	34 3	34 3	36 3	37 3	38 3	38 3	38 3	37 3
Holders-up	24-25	—	—	—	28 -	28 -	30 -	31 -	32 -	32 -	32 -	31 -
Ship—		'87.	'88.									
Angle smiths...	—	—	—	—	36 10	36 10	38 4	39 4	40 10	40 10	39 4	39 4
Heavy platers	—	32 -	33 6	—	34 9	34 9	36 3	37 3	38 9	38 9	37 6	37 6
Light "	—	—	—	—	34 9	34 9	36 3	37 3	38 9	38 9	37 6	37 6
Riveters	—	30 -	31 6	—	32 6	32 6	34 -	35 -	36 6	36 6	35 -	35 -
Caulkers	—	30 -	31 6	—	32 6	32 6	34 -	35 -	36 6	36 6	35 -	35 -
Holders-up	—	24 -	25 6	—	26 6	26 6	28 -	29 -	30 6	30 6	29 -	29 -
BIRKENHEAD AND LIVERPOOL.												
Boiler—												
Angle smiths	38-40	43 -	43 -	—	{ 41 6 } { 42 - }	{ 39 6 } { 40 - }	{ 41 6 } { 40 - }	42 6	44 -	41 -	41 -	44 -
Heavy platers	36,38	42 -	42 -	—	{ 39 6 } { 40 - }	{ 37 6 } { 38 - }	39 6	40 6	42 -	42 -	42 -	42 -
Riveters	30-32	37 -	37 -	—	{ 35 - } { 36 6 }	{ 33 6 } { 34 - }	35 6	36 6	38 -	38 -	38 -	38 -
Holders-up	25,26	30 6	30 6	—	{ 29 - } { 28 6 }	{ 27 6 } { 28 - }	29 6	30 6	32 -	32 -	32 -	32 -
Ship—												
Angle smiths	36,38	—	—	—	39 6	38 6	39 6	40 6	42 -	42 -	42 -	42 -
Heavy platers	36,38	—	—	—	39 6	38 6	39 6	40 6	42 -	42 -	42 -	42 -
Light "	—	—	—	—	37 6	36 6	37 6	38 6	40 -	40 -	40 -	40 -
Riveters	30,32	—	—	—	33 6	32 6	33 6	34 6	36 -	36 -	36 -	36 -
Caulkers	30,32	—	—	—	33 6	32 6	33 6	34 6	36 -	36 -	36 -	36 -
Holders-up	{ 24 } { 25 8 }	—	—	—	27 6	26 6	27 6	28 6	30 -	30 -	30 -	30 -
Boilermakers rose in 1888.												
BIRMINGHAM.												
Boiler—												
Angle smiths	—	—	—	38 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -
Heavy platers	—	—	—	38 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -
Light "	—	—	—	—	31 -	31 -	31 -	36 -	36 -	36 -	36 -	36 -
Riveters	—	—	—	30 -	30 -	30 -	30 -	32 -	32 -	32 -	32 -	32 -
CARDIFF.												
Boiler—												
Angle smiths	39 -	—	—	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
Heavy platers	39 -	—	—	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
Riveters	33 -	—	—	38 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -
Caulkers	33 -	—	—	38 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -
Holders-up	24 -	—	—	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -
Ship—												
Angle smiths	39 -	—	—	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -
Heavy platers	39 -	—	—	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -
Riveters	33 -	—	—	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
Caulkers	33 -	—	—	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
Holders-up	24 -	—	—	36 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -

* Fell $\frac{1}{2}$ per cent. on Time Wages in 1892.

TABLE 4 *Contd.*—*Time Wages of Boilermakers and Iron Shipbuilders.*

	1873.	'89.	'90.	'91.	'92.	'93-95.	'96.	'97.	'98.	'99-01.	'02.	'03-04.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
DUNDEE.												
Boiler—												
Heavy platers	29 -	—	—	—	38 -	38 -	38 -	39 -	41 -	41 -	41 -	40 -
Light platers	—	—	—	—	36 -	36 -	36 -	37 -	39 -	39 -	39 -	38 -
Riveters	27-28	—	—	34 10½	33 9	33 9	34 10½	36 -	38 -	38 -	38 -	37 -
Caulkers	27-28	—	—	34 10½	33 9	33 9	34 10½	36 -	38 -	38 -	38 -	37 -
Holders-up ...	20 -	—	—	—	20 -	20 -	21 -	21 -	23 -	23 -	23 -	22 -
Ship—												
Angle smiths	29 -	—	—	—	36 -	36 -	37 1½	38 3	38 3	38 3	38 3	38 3
Heavy platers	29 -	—	—	—	36 -	36 -	37 1½	37 1½	37 1½	37 1½	37 1½	37 1½
Light platers	—	—	—	—	36 -	36 -	37 1½	37 1½	37 1½	37 1½	37 1½	37 1½
Riveters	27-28	—	—	34 10½	33 9	33 9	34 10½	36 -	36 -	36 -	36 -	36 -
Caulkers	27-28	—	—	34 10½	33 9	33 9	34 10½	37 1½	37 1½	37 1½	37 1½	37 1½
Holders-up ...	20 -	—	—	—	25 -	25 -	26 -	26 -	26 -	26 -	26 -	26 -
Shipbuilders rose in 1888.												
HULL.												
Boiler—												
Angle smiths	42 -	—	—	—	39 6	39 6	39 6	41 -	42 -	42 -	42 -	42 -
Heavy platers	38 -	—	—	—	37 6	37 6	37 6	39 -	40 -	40 -	40 -	40 -
Light platers	—	—	—	—	37 6	37 6	37 6	39 -	40 -	40 -	40 -	40 -
Riveters	32	—	—	—	32 6	32 6	32 6	34 -	35 -	35 -	35 -	35 -
Caulkers	30-32	—	—	—	32 6	32 6	32 6	34 -	35 -	35 -	35 -	35 -
Holders-up ...	24 -	—	—	—	27 -	27 -	27 -	28 6	29 6	29 6	29 6	29 6
Ship—												
Angle smiths	42 -	—	—	—	39 -	38 -	39 6	41 -	43 -	42 -	42 -	42 -
Heavy platers	38 -	—	—	—	37 -	36 -	37 6	39 -	40 -	40 -	40 -	40 -
Light platers	—	—	—	—	37 -	36 -	37 6	39 -	40 -	40 -	40 -	40 -
Riveters ...	32	—	—	—	32 -	31 -	32 6	34 -	35 -	35 -	35 -	35 -
Caulkers ...	31-32	—	—	—	32 -	31 -	32 6	34 -	35 -	35 -	35 -	35 -
Holders-up ...	24 -	—	—	—	26 6	26 -	27 -	28 6	29 6	29 6	29 6	29 6
LEEDS.												
Boiler—												
Angle smiths	38-40	—	—	38, 40	38, 40	38 -	40 -	40 -	41 -	42 -	42 -	42 -
Heavy platers	36-28	—	—	36, 38	36, 38	34 -	36 -	36 -	37 -	38 -	38 -	38 -
Light platers	—	—	—	34, 36	34, 36	34 -	36 -	36 -	37 -	38 -	38 -	38 -
Riveters	26-32	—	—	30, 33	30, 33	30 -	32 -	32 -	33 -	34 -	34 -	34 -
Holders-up ...	22-26	—	—	26, 28	26, 28	25 -	27 -	27 -	28 -	29 -	29 -	29 -
LONDON.												
New Work.												
Ship and Boiler—												
Angle smiths	36-44	—	—	—	45 -	45 -	45 -	45 -	45 -	45 -	45 -	45 -
Heavy platers	36-42	—	—	—	45 -	45 -	45 -	45 -	45 -	45 -	45 -	45 -
Light platers	—	—	—	—	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
Riveters ...	33-38	—	—	—	36 -	36 -	36 -	36, 38	36, 38	38 -	38 -	38 -
Caulkers ...	28-33	—	—	—	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -
Holders-up ...	29-26	—	—	—	33 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -
Repairs.												
Ship and Boiler—		87-90										
Angle smiths..	—	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -
Heavy platers	—	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -	48 -
Light platers...	—	—	—	—	45 -	45 -	45 -	45 -	45 -	45 -	45 -	45 -
Riveters	—	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
Caulkers	—	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
Holders-up ...	—	—	—	—	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
MANCHESTER.												
Boiler—												
Angle smiths...	40 -	No change from 1885 to 1897				40 6	40 6	40 6	41 6	42 -	42 -	42 -
Heavy platers	38 -					38 -	38 -	38 -	39 -	39 6	39 6	39 6
Light platers...	—					36 6	36 6	36 6	37 6	38 -	38 -	38 -
Riveters	34 -					34 -	34 -	34 -	35 -	35 6	35 6	35 6
Caulkers	—					34 -	34 0	34 -	35 -	35 6	35 6	35 6
Holders-up ...	30-32					32 -	32 -	32 -	33 -	33 6	33 6	33 6
PORTSMOUTH.												
Boiler and Ship—												
Angle smiths	38 -	—	37 -	38 -	36 -	—	—	—	—	38 -	38 -	38 -
Heavy platers	38 0	—	—	—	36 -	—	—	—	—	38 -	38 -	38 -
Light platers	—	—	—	—	—	—	—	—	—	38 -	38 -	38 -
Riveters	33 -	—	32 -	33 -	33 -	{ No change recorded. Date of rise uncertain. }				36 -	36 -	36 -
Caulkers	—	—	—	—	33 -					36 -	36 -	36 -
Holders-up ...	24 -	—	—	—	24 -					27 6	27 6	27 6

TABLE 4 *Contd.*—*Time Wages of Boilermakers and Iron Shipbuilders.*

	1873.	'89.	'90.	'91.	'92.	'93-95.	'96.	'97.	'98.	'99-01.	'02.	'03-04.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
PRESTON.												
Boiler—												
Angle smiths	38 -	-	38 -	40 -	40 -	40 -	40 -	40 -	41 -	41 6	41 6	41 6
Heavy platers	36, 38	-	36 -	38 -	38 -	38 -	38 -	38 -	39 -	39 6	39 6	39 6
Light „	-	-	36 -	38 -	38 -	38 -	38 -	38 -	39 -	39 6	39 6	39 6
Riveters	32 -	-	32 -	34 -	34 -	34 -	34 -	34 -	35 -	35 6	35 6	35 6
Caulkers	32 -	-	32 -	34 -	34 -	34 -	34 -	34 -	35 -	35 6	35 6	35 6
Helpers-up	22, 24	-	30 -	32 -	32 -	32 -	32 -	32 -	33 -	33 6	33 6	33 6
SOUTHAMPTON.												
Boiler—												
Angle smiths	32 -	-	rose 2s.	37 6	37 6	37 6	37 6	37 6	37 6	39 -	39 -	41 -
Heavy platers	32 -	-		37 6	37 6	37 6	37 6	37 6	37 6	39 -	39 -	41 -
Light „	-	-		37 6	37 6	37 6	37 6	37 6	37 6	39 -	39 -	41 -
Riveters	30 -	-		34 6	34 6	34 6	34 6	34 6	34 6	36 -	36 -	38 -
Caulkers	30 -	-		34 6	34 6	34 6	34 6	34 6	34 6	36 -	36 -	38 -
Helpers-up	20 -	-		29 -	29 -	29 -	29 -	29 -	30 6	30 6	30 6	32 6

A very large proportion of iron shipbuilding is done on piecework. Mr. R. Knight, the late secretary of the Boilermakers' and Iron Shipbuilders' Union, stated to the Commission on Trade Depression that nearly all of it was done by piecework, and this is repeated in *Report on Standard Time Rates*, 1893, with regard to the rates given there for Barrow. In the wage census pieceworkers are in the majority in plating, riveting and caulking. The changes in piece price lists, therefore, would seem to be especially important, and these have been tabulated for the chief shipbuilding centres in Table 7. When this is examined in relation to the time rates, however, some doubts arise as to their being really representative of changes in earnings. Comparing 1893 and 1904 we find that shipbuilders' (platers') piece and time wages rose or fell:—

	Piece.	Time.
		s. d.
Type	Unchanged	Rose 1 6
Wear	"	" 1 6
Tees	"	" 1 6
Hull	"	" 3 -
Belfast	"	" 3 6
Mersey	Rose 5 per cent.	" 2 6
Barrow-in-Furness	Unchanged	" 2 6
Clyde	Rose 5 per cent.	" 3 1½
Dundee	Unchanged	" 1 1½
Aberdeen	Rose 10 per cent.	" 2 6

It may be, therefore, that we have some such problem as arises when considering wages, *e.g.*, in the cotton trade, where, apart from changes in the list, earnings have a tendency to rise through improvements in machinery. From year to year the percentage changes in piece prices may indicate changes in earnings, but over a long period it would seem that the figures need some adjustment.

TABLE 4A.—Percentage Changes in Piece Rates.
 BOILERMAKING AND IRON SHIPBUILDING, 1891-04 (a).
 (+ = rise, and - = fall.)

		1891.	'92.	'93.	'94.	'95.	'96.	'97.
Tyne	{ boiler	....	....	? - 5	....	....	+ 5	+ 5
	{ ship	....	....	- 5	....	....	+ 5	+ 5
Wear	{ boiler	....	- 5	? - 5	....	....	+ 5	+ 5
	{ ship	....	- 10	- 5	....	....	+ 5	+ 5
Tees	{ boiler	....	- 5	? - 5	....	....	+ 5	+ 5
	{ ship	....	....	- 5	....	....	+ 5	+ 5
Hull	{ boiler	....	....	....	....	....	+ 5	+ 5
	{ ship	....	....	- 2½	....	....	+ 5	+ 5
Belfast	{ boiler	....	? - 5	- 5	- 2½	....	+ 10	+ 2½
	{ ship	....	? - 5	- 5	- 2½	....	+ 10	+ 2½
Mersey	{ boiler	....	....	....	....	....	+ 5	+ 5
	{ ship	....	....	- 5	....	....	+ 5	+ 5
Barrow-in-Furness	{ boiler	None	- 7½	....	....	....	?	+ 5
	{ ship	....	....	....	....	....	?	+ 5
Clyde	{ boiler	....	....	- 5	....	....	+ 7½ ^b	....
	{ ship	....	....	- 5	....	....	+ 10	....
Dundee	{ boiler	- 5	....	....	....	....	....	....
	{ ship	....	....	....	....	....	+ 5 ^c	+ 5 ^d
Aberdeen	{ boiler	None	....	....	....	....	....	....
	{ ship	....	- 5	....	....	....	+ 5 ^e	+ 5

		1898.	'99.	1900-01.	'02.	'03.	'04.
Tyne	{ boiler	+ 2½	....	....	- 5	- 2½	....
	{ ship	+ 5	....	....	- 5	....	- 5
Wear	{ boiler	+ 2½	....	....	....	- 2½	....
	{ ship	+ 5	....	....	- 5	....	- 5
Tees	{ boiler	+ 2½	....	....	....	- 2½	....
	{ ship	+ 5	....	....	- 5	....	- 5
Hull	{ boiler	+ 2½	....	....	....	- 2½	....
	{ ship	+ 2½	....	....	....	- 5	- 5 ^f
Belfast	{ boiler	+ 2½	+ 2½	....	....	- 5	- 5
	{ ship	+ 2½	+ 2½	....	....	- 5	- 5
Mersey	{ boiler	+ 5	....	....	- 5	....	....
	{ ship	+ 5	....	....	- 5	....	....
Barrow-in-Furness	{ boiler	+ 2½	....	....	....	- 2½	....
	{ ship	+ 5	....	....	- 5	....	- 5
Clyde	{ boiler	+ 5	....	....	....	- 5	....
	{ ship	+ 5	....	....	....	....	- 5
Dundee	{ boiler	+ 5	....	....	....	- 5	- 5
	{ ship	....	....	....	....	- 5	- 5
Aberdeen	{ boiler	+ 5	....	....	....	- 5	....
	{ ship	+ 5	....	....	....	- 5	....

a Where no change is recorded after 1892, none is mentioned in the changes in wages reports. In 1891-92 the blank spaces do not necessarily mean that none took place, only that no mention of any has been found.

b 6th March, 500 rose 5 per cent.; 300 rose 2½ per cent.

27th November, 500 rose 2½ per cent.; 400 rose 5 per cent.

c Platers and A.I.S. Rivetters had a new list, stated to equal an advance of 5 per cent.

d Only platers and A.I.S. mentioned.

e Apparently not holders-up.

f A.I.S., platers, caulkers, and chippers.

g Rivetters and holders-up.

TABLE 5 (a).—Trade Union Standard Rates

	1850.	'51.	'52.	'53.	'54.	'55.	'56.	'57.	'58.	'59.	'60.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
LONDON.											
Shipwrights	39	39	39	42	51	—	—	42	42	42	42
Bargebuilders	36	36	36	36	36	36	36	36	36	36	36
Amalgamated Society of Engineers	—	34	34	34	34	34	34	34	34	34	34
Sailmakers	30	30	30	30	30	30	30	30	30	30	30
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—
Smiths' strikers	—	—	—	—	—	—	—	24	24	24	24
BELFAST.											
Grassmoulders and finishers ...	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—
BIRMINGHAM.											
Amalgamated Society of Engineers	—	—	—	—	—	—	—	—	—	—	28
BIRKENHEAD.											
Engine shops	—	—	—	—	—	—	—	—	—	—	—
Fitters	—	—	—	—	29	28	3	29	30	6	28
Turners	—	—	—	—	29	4	30	3	31	3	33
Smiths	—	—	—	—	31	—	31	5	32	—	31
Planers	—	—	—	—	—	—	—	—	30	—	29
Patternmakers	—	—	—	—	28	—	23	6	29	—	28
Joiners	—	—	—	—	—	—	—	—	27	6	29
Coppersmiths	—	—	—	—	31	6	30	10	28	10	29
Boiler shops—	—	—	—	—	—	—	—	—	28	—	30
Angle smiths	—	—	—	—	34	—	34	—	35	—	34
Platers	—	—	—	—	31	6	31	—	30	6	32
Riveters	—	—	—	—	—	—	—	—	30	—	30
Holders-up	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	32	—	31	6	33	—	33
BLACKBURN.											
Fitters	—	—	—	—	—	26	—	26	—	26	—
Turners	—	—	—	—	—	26	—	26	—	26	—
Smiths	—	—	—	—	—	25	—	25	—	25	—
Ironmoulders	—	—	—	—	—	32	—	32	—	32	—
BRADFORD.											
Fitters and turners	—	—	—	—	—	—	—	—	—	—	23
Smiths	—	—	—	—	—	—	—	—	—	—	24
Iron moulders	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—
BRISTOL.											
Amalgamated Society of Engineers	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders and finishers ...	—	—	—	—	—	30	—	30	—	30	—
Smiths	—	—	—	—	—	30	—	30	—	30	—
Shipwrights	—	24	—	—	—	30	—	30	—	30	—
Ship and Boiler—	—	—	—	—	—	—	—	—	—	—	—
Platers	—	—	—	—	—	35	—	35	—	35	—
Riveters	—	—	—	—	—	29	6	29	6	29	6
Holders-up	—	—	—	—	—	20	—	20	—	20	—
DERBY.											
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—
DUBLIN.											
Turners	—	—	—	—	—	—	—	28	—	28	—
Fitters	—	—	—	—	—	—	—	28	—	28	—
Patternmakers	—	—	—	—	—	—	—	28	—	28	—
Ironmoulders	—	—	—	—	—	—	—	33	—	33	—
Shipwrights	—	—	—	—	24, 27	—	—	30	—	30	—
Shipjoiners	—	—	—	—	—	—	—	30	—	28	—
Smiths	—	—	—	—	—	—	—	28	—	28	—

in Engineering and Shipbuilding, 1850-1904.

[illegible]

TABLE 5 (a) *Contd.—Trade Union Standard Rates*

	1876.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
LONDON.												
Shipwrights	42	- 42	- 42	- 42	- 42	- 42	- 42	- 42	- 42	- 42	- 42	- 42
Largebuilders	39	- 39	- 40	- 40	- 40	- 40	- 40	- 40	- 40	- 40	- 40	- 40
Amalgamated Society of Engineers	36	- 36	- 36	- 36	- 36	- 36	- 36	- 38	- 38	- 38	- 38	- 38
Sailmakers	36	- 36	- 36	- 36	- 36	- 36	- 36	- 36	- 36	- 36	- 36	- 36
Ironmoulders	38	- 38	- 38	- 38	- 38	- 38	- 38	- 38	- 38	- 38	- 38	- 38
Smiths' strikers	—	—	—	—	—	—	—	—	—	—	—	—
BELFAST.												
Brassmoulders and finishers	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	34	- 34	- 34	- 34	- 31	- 31	- 34	- 33	- 32	- 31	- 31	- 31
BIRMINGHAM.												
Amalgamated Society of Engineers	30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30
BIRKENHEAD.												
Engine shops	—	—	—	—	—	—	—	—	—	—	—	—
Fitters	53	—	—	—	—	—	—	—	—	—	—	—
Turners	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	31	- 31	- 31
Joiners	—	—	—	—	—	—	—	—	—	—	—	—
Coppersmiths	—	—	—	—	—	—	—	—	—	—	—	—
Boiler Shops—	—	—	—	—	—	—	—	—	—	—	—	—
Angle smiths	37	- 37	- 37	- 35	6	—	—	—	—	—	—	—
Platers	37	- 37	- 37	- 35	6	—	—	—	—	—	—	—
Riveters	32	- 32	- 32	- 30	—	—	—	—	—	—	—	—
Holders-up	25	3	25	3	22	3	—	—	—	—	—	—
Iron moulders	—	—	—	—	—	—	—	—	—	34	—	—
BLACKBURN.												
Fitters	—	—	—	—	—	—	—	—	—	32	—	—
Turners	—	—	—	—	—	—	—	—	—	32	—	—
Fitters	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—
BRADFORD.												
Fitters and turners	—	—	—	—	—	—	—	—	29	9	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	32	- 32	30	- 30	- 30	0	- 30	- 30	- 30	- 32	- 32	- 32
Patternmakers	34	- 34	—	—	—	—	—	—	—	29	- 29	- 29
BRISTOL.												
Amalgamated Society of Engineers	32	- 32	- 30	- 30	- 30	- 32	- 32	- 32	- 32	- 32	- 32	- 32
Ironmoulders	30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30	- 30
Bras-moulders and finishers	32	- 32	- 32	- 32	- 32	- 32	- 32	- 32	- 32	- 32	- 32	- 32
Smiths	—	—	—	—	—	—	—	33	—	—	—	—
Shipwrights	—	—	—	—	—	—	—	36	—	36	- 36	- 36
Ship and Boiler—	—	—	—	—	—	—	—	—	—	—	—	—
Platers	—	—	—	—	—	—	—	39	—	—	—	—
Riveters	—	—	—	—	—	—	—	35	—	—	—	—
Holders-up	—	—	—	—	—	—	—	25	—	—	—	—
DERBY.												
Ironmoulders	32	- 32	- 32	- 32	- 32	{ 34	- 34	- 34	- 34	- 34	- 34	- 34
						{ 32	- 32	- 32	- 32	- 32	- 32	- 32
DUBLIN.												
Turners	—	—	—	—	—	—	—	—	—	—	—	—
Fitters	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	—
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—

in Engineering and Shipbuilding, 1850-1904.

'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99.	1900.	'01.	'02.	'03-04.
<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -
40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	40 - 40 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -	42 - 42 -
38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -
36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -	36 - 36 -
38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -	38 - 38 -
—	—	—	—	—	27 -	—	—	—	—	—	—	—	—	—	—
—	—	32 -	32 -	34 {	32 -	32 -	34 -	34 {	36 -	37 -	37 -	37 -	37 -	37 -	36 -
34 -	34 -	34 -	34 -	33 -	34 {	34 -	32 -	32 -	36 -	37 -	38 -	38 -	38 -	38 -	37 -
—	—	—	—	—	32 -	32 -	32 -	32 -	38 -	39 -	40 -	40 -	40 -	40 -	37 -
30 -	30 -	32 -	32 -	32 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -	36 -	36 -
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	34 -	33 -	33 -	34 -	34 -	35 -	36 -	36 -	36 -	36 -	36 -
—	—	—	—	—	34 -	33 -	33 -	34 -	34 -	35 -	36 -	36 -	36 -	36 -	36 -
—	—	—	—	—	36 -	35 -	35 -	36 -	36 -	37 -	38 -	38 -	38 -	38 -	38 -
—	—	—	—	—	31 -	30 -	30 -	31 -	31 -	32 -	33 -	33 -	33 -	33 -	33 -
32 -	36 -	37 -	37 -	35 -	35 -	35 -	35 -	37 -	37 -	38 -	39 -	39 -	39 -	39 -	39 -
—	—	—	—	22 -	22 -	22 -	22 -	33 -	33 -	36 -	36 -	36 -	36 -	36 -	36 -
—	—	—	—	36 -	35 -	35 -	35 -	36 -	36 -	37 -	38 -	38 -	38 -	38 -	38 -
—	43 -	43 -	—	41 -	39 -	39 -	39 -	41 -	42 -	44 -	44 -	44 -	44 -	44 -	44 -
—	42 -	42 -	—	39 -	37 -	37 -	37 -	39 -	40 -	42 -	42 -	42 -	42 -	42 -	42 -
—	37 -	37 -	—	35 -	34 -	34 -	34 -	35 -	36 -	38 -	38 -	38 -	38 -	38 -	38 -
—	30 -	30 -	—	29 -	28 -	28 -	28 -	29 -	30 -	32 -	32 -	32 -	32 -	32 -	32 -
36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	38 -	38 -	40 -	40 -	40 -	40 -	40 -
—	—	—	—	—	—	—	—	38 -	40 -	40 -	42 -	42 -	42 -	42 -	42 -
—	—	32 -	32 -	32 -	32 -	32 -	32 -	34 -	34 -	34 -	35 -	35 -	35 -	35 -	35 -
—	—	32 -	32 -	32 -	32 -	32 -	32 -	34 -	34 -	34 -	35 -	35 -	35 -	35 -	35 -
36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	38 -	38 -	39 -	39 -	39 -	39 -	39 -	39 -
—	—	29 -	—	30 -	30 -	30 -	30 -	32 -	32 -	32 -	33 -	34 -	34 -	34 -	34 -
—	—	—	—	30 -	30 -	30 -	30 -	32 -	32 -	32 -	33 -	34 -	34 -	34 -	34 -
32 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	37 -	38 -	38 -	38 -	38 -
30 -	33 -	33 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	37 -	37 -	38 -	38 -	38 -
32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	33 -	33 -	33 -	36 -	36 -	36 -	36 -	36 -
30 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -	36 -
32 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -
—	—	32 -	32 -	32 -	32 -	32 -	32 -	33 -	33 -	33 -	36 -	36 -	36 -	36 -	36 -
36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
—	—	35 -	35 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
—	—	31 -	31 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -
—	—	22 -	22 -	23 -	23 -	23 -	23 -	23 -	23 -	23 -	23 -	26 -	26 -	26 -	26 -
34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	35 -	36 -	38 -	38 -	38 -	38 -	38 -
32 -	32 -	32 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -
—	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -
—	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -
—	34 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -
34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -	36 -	36 -
—	33 -	36 -	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	33 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -	33 -

TABLE 5 (a) *Contd.*—Trade Union Standard Rates

	1850.		'51.		'52.		'53.		'54.		'55.		'56.		'57.		'58.		'59.		'60.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
DUNDEE.																						
Amalgamated Society of Engineers	16.	18	19	—	19	—	19	—	19	—	20	—	21	—	22	—	22	—	20	—	19	—
Smiths†	16	—	17	—	—	—	18	—	—	—	19	—	—	—	20	—	—	—	18	5	—	—
EDINBURGH AND LEITH.																						
Fitters	40	—	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	—
Turners	21	—	21	—	21	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	—
Smiths	22	—	24	—	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	21	—	21	—	20	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25	—
Strikers	—	—	—	—	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders	—	—	—	—	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	18	—	18	—	22	—	—	—	—	—	20	—	20	—	20	—	—	—	—	—	22	—
Labourers	18	—	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22	—
Shipwrights	12	—	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	—
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
LIVERPOOL.																						
Shipwrights { New	30	—	30	—	30	—	36	—	42	—	36	—	36	—	36	—	36	—	30	—	30	—
Repairs	—	—	—	—	36	—	42	—	48	—	42	—	42	—	42	—	42	—	36	—	36	—
NOTTINGHAM.																						
Amal. Society of Engineers...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	—	26	—
NEWPORT.																						
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MONIFIETH.																						
Amal. Society of Engineers...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
*NEWCASTLE.																						
Smiths	40.	—	50.	—	—	—	—	—	—	—	24	—	—	—	—	—	—	—	—	—	26	—
Millwrights	20	—	21	—	—	—	—	—	—	—	25	—	—	—	—	—	—	—	—	—	27	—

* At Chemical Works. From the Commission on Trade Depression.

† At the Harbour Works.

in Engineering and Shipbuilding, 1850-1904.

'61.	'62.	'63.	'64.	'65.	'66.	'67.	'68.	'69.	'70.	'71.	'72.	'73.	'74.	'75.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
19 -	19 -	—	rising	slowly to	—	—	—	—	—	25 -	for a few years	—	—	—
—	21 6	—	—	22 -	—	—	—	—	—	—	24 -	—	—	—
20 6	—	21 5	—	22 7	—	23 6	—	21 3	—	21 3	—	27 1	—	27 1
24 }	21 -	{—	—	—	26 -	—	—	—	—	—	—	—	—	—
26 }	—	{—	—	—	26 6	—	—	—	—	—	—	—	33 6	34 6
24 -	—	—	—	—	26 6	—	—	—	—	—	—	—	32 -	32 -
—	—	—	—	—	17 -	—	—	—	—	—	—	—	19 9	21 -
—	—	—	—	—	25 -	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	28 6	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15 6	—	—	—	—	16 -	—	—	—	—	—	—	—	—	—
—	—	—	—	28 9	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30 -	30 -	—	36 -	—	36 -	—	—	—	—	—	36 -	—	—	39 -
36 -	36 -	—	42 -	—	42 -	—	—	—	—	—	42 -	—	—	42 -
26 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	32 -	32 -	32 -	32 -
—	—	27 -	27 -	27 -	27 -	27 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -
—	20 -	—	—	24 -	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	28 -	20 -	20 -	—	—	27 -	28 -	32 -	32 -	32 -
—	—	—	—	—	28 -	20 -	20 -	—	—	28 -	30 -	32 -	32 -	32 -
—	—	—	—	—	—	30 -	30 -	—	—	—	—	—	—	—

except 1866-68 and '71, which are from the *Returns of Wages*.

TABLE 5 (a) *Contd.*—Trade Union Standard Rates

	1876.		'77.		'78.		'79.		'80.		'81.		'82.		'83.		'84.		'85.		'86.		'87.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
DUNDEE.																								
Amalgamated Society of Engineers	—	—	fel	1	—	—	—	—	26	—	26	—	28	—	28	—	26	—	26	—	26	—	27	—
Smiths †	—	—	—	—	—	—	—	—	26	—	—	—	—	—	29	—	—	—	25	—	—	—	—	—
Smiths †	—	—	28	2	—	—	27	—	—	—	29	3	—	—	30	11	29	10	29	3	—	—	29	3
EDINBURGH AND LEITH.																								
Fitters	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31	6	—	—	27-28	—	—	—
Turners	34	6	34	6	32	—	—	—	—	—	—	—	—	—	—	—	31	6	—	—	—	—	—	—
Smiths	28	6	27	—	26	—	—	—	—	—	—	—	—	—	—	—	30	6	—	—	—	—	—	—
Strikers	21	—	21	—	19	9	—	—	—	—	—	—	—	—	—	—	19	1½	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	1½	29	3	28	1½	28	1½
Ironmoulders	—	—	—	—	29	6	—	—	—	—	—	—	—	—	—	—	34	10½	—	—	—	—	—	—
Brassmoulders	—	—	—	—	25	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18	6	—	—	—	—	—	—
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	4½	30	4½	30	4½
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25	10½	25	10½	27	6
LIVERPOOL.																								
Shipwrights { New	39	—	39	—	39	—	39	—	39	—	39	—	39	—	39	—	39	—	39	—	39	—	39	—
Shipwrights { Repairs	42	—	42	—	42	—	42	—	42	—	42	—	42	—	42	—	42	—	42	—	42	—	42	—
NOTTINGHAM.																								
Amal. Society of Engineers	32	—	32	—	32	—	32	—	32	—	32	—	34	—	34	—	34	—	34	—	34	—	34	—
NEWPORT.																								
Shipwrights	30	—	30	—	30	—	30	—	30	—	36	—	36	—	36	—	36	—	36	—	36	—	36	—
MONIFIETH.																								
Amal. Society of Engineers	27	—	—	—	25	—	—	—	—	—	—	—	—	—	28	—	—	—	25	—	—	—	—	—
NEWCASTLE.*																								
Smiths	32	—	30	6	28	—	26	—	27	6	30	—	30	—	31	6	31	6	27	6	—	—	—	—
Millwrights	32	—	30	6	28	—	26	—	27	6	30	—	30	—	31	6	31	6	28	6	—	—	—	—

* At Chemical Works. From the Commission on Trade Depression,
† At the Harbour Works.

in Engineering and Shipbuilding, 1850-1904.

'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99.	1900.	'01.	'02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
27 -	29 -	29, 30	} 30 -	{ F. 26 - Sm. 27 -	26 -	26 -	26 -	28 -	28 -	30 -	32 -	32 -	32 -	32 -	32 - 31
-	-	-			27 -	27 -	27 -	29 -	29 -	29 -	32 -	33 -	33 -	33 -	33 -	33 - 32 -
-	29 3	-	32 7	-	31 6	-	31 6	-	-	-	-	-	-	-	-
-	31 6	32 7½	29 -	{ - 											

except 1366-68 and '78, which are from the *Returns of Wages*.

	Previous to 1872.	1872	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.
BARROW-IN-FURNESS.															
Shipwrights	1865-69, 27s.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Shipjoiners															
Turners															
Fitters															
Smiths															
Patternmakers															
Ironmoulders															
BELFAST.															
Ship—															
Angle smiths															
Platers															
Riveters															
Caulkers															
Holders-up															
Boiler—															
Angle smiths															
Platers															
Riveters															
Caulkers															
Holders-up															
Patternmakers															
Fitters															
Turners															
Smiths															
Shipwrights															
Shipjoiners															
Sailmakers															
BIRMINGHAM.															
Fitters, turners, smiths	1862, 32s. { 30 32 }														
Patternmakers															
Ironmoulders															
CARDIFF.															
Marine—															
Fitters															
Turners															
Smiths															
Patternmakers															
Ironmoulders															
Shipwrights	1863, 27s. rose about 1866 and 1872														
Shipjoiners															
Engine															
Fitters															
Turners															
Smiths															
Patternmakers															
Ironmoulders															
CORK.															
Fitters	1855-61, Minimum.														
Turners															
Smiths															
Patternmakers	1862 A.S.E., 28s. 3d.														
Ironmoulders															
DURRY.															
Fitters	1862, 26														
Turners															
Smiths															

in Engineering and Shipbuilding, 1872-1904.

'86.	'87.	'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99-00.	'01-02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
30 6	30 6	32 6	36 -	36 -	36 -	35 -	34 6	34 6	34 6	36 6	37 7½	38 9	38 9	38 9	37 7½
29 -	29 -	30 6	33 -	35 -	35 -	34 -	34 -	33 6	33 6	36 -	37 1½	38 3	38 3	38 3	37 1½
-	-	-	-	-	34 9	32 6	31 6	32 6	32 6	35 -	35 -	37 -	37 -	37 -	36 -
32 -	32 -	34 -	34 -	36 -	36 -	36 -	35 6	34 6	34 6	34 -	34 -	36 -	36 -	36 -	35 -
-	-	31 6	34 -	34 -	34 -	34 -	34 -	34 -	34 -	35 -	36 -	38 -	38 -	39 -	38 -
-	-	-	-	-	38 -	36 6	35 6	35 -	35 -	37 -	38 -	39 -	40 -	40 -	40 -
29 -	29 -	31 -	33 -	37 -	36 6	35 -	34 6	33 6	33 6	35 6	36 6	37 6	38 6	38 6	38 6
26 -	26 -	28 -	30 -	31 -	33 6	32 -	31 -	30 6	30 6	32 6	33 6	34 6	35 6	35 6	35 6
-	-	-	-	-	34 -	32 -	31 -	30 6	30 6	32 6	33 6	34 6	35 6	35 6	35 6
-	-	-	-	-	33 6	32 -	31 -	30 6	30 6	32 6	33 6	34 6	35 6	35 6	35 6
-	-	-	-	-	26 6	25 -	24 -	23 6	23 6	25 6	26 6	27 6	28 6	28 6	28 6
36 -	34 -	36 -	38 -	41 6	41 6	40 -	39 -	38 6	38 6	40 6	41 6	42 6	43 6	43 6	42 6
28 -	28 -	30 -	32 -	36 -	36 -	34 6	33 6	33 -	33 -	35 -	36 -	37 -	38 -	38 -	37 -
-	-	-	-	-	36 -	34 6	33 6	33 -	33 -	35 -	36 -	37 -	38 -	38 -	37 -
-	-	-	-	-	26 6	25 0	24 -	23 6	23 6	25 6	26 6	27 6	28 6	28 6	27 6
29 -	29 -	32 -	34 -	35 -	35 -	34 -	33 -	33 -	33 -	37 -	38 -	39 -	39 -	39 -	39 -
-	-	-	33 -	34 -	33 -	32 -	32 -	32 -	32 -	34 -	36 -	37 -	37 -	37 -	36 -
-	-	-	-	-	34 -	33 -	32 -	32 -	32 -	35 -	37 -	38 -	38 -	38 -	37 -
28 -	28 -	30 6	32 7½	33 9	34 -	33 6	32 7½	33 6	33 6	35 9	37 1½	38 3	38 3	38 3	37 1½
-	-	-	-	-	31 -	31 -	31 -	31 -	31 -	31 -	32 -	32 -	32 -	32 -	32 -
32 -	32 -	32 -	32 -	32 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -
34 -	31 -	34 -	34 -	34 -	36 -	36 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -	38 -
36 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -	38 -
36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -
36 -	36 -	36 -	36 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	40 -	41 -
36 -	36 -	36 -	36 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	40 -	41 -
36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	38 -
-	-	32 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	34 -	34 -	34 -	36 -	36 -	36 -
36 -	36 -	36 -	36 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -	39 -
-	-	-	-	-	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	35 -
30 -	32 -	32 -	32 -	33 -	33 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -
30 -	32 -	32 -	32 -	33 -	33 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -	34 -
-	-	25 -	28 -	28 -	28 -	28 -	28 -	28 -	30 -	32 -	32 -	32 -	34 -	34 -	34 -
28 -	28 -	28 -	28 -	29 -	29 -	29 -	29 -	29 -	29 -	31 -	31 -	31 -	33 -	33 -	33 -
28 -	28 -	28 -	28 -	29 -	29 -	29 -	29 -	29 -	29 -	31 -	31 -	31 -	33 -	33 -	33 -
30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	30 -	32 -	34 -	34 -	36 -	36 -	36 -	36 -
30 -	30 -	30 -	32 -	32 -	32 -	32 -	32 -	32 -	32 -	34 -	34 -	36 -	36 -	36 -	36 -
-	-	-	-	28 -	28 -	28 -	28 -	28 -	28 -	28 -	30 -	30 -	32 -	32 -	32 -

TABLE 5 (b) *Contd.*—*Trade Union Standard Rates*

	Previous to 1872.	1872	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.	
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
BUNDLE.																
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—	—	28 1½	25 10½	
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—	34 —	—	29 —	
Brass finishers	—	—	—	—	—	—	—	—	—	—	—	—	35 —	—	30 —	
Brassmoulders	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
HULL.																
Fitters	1862. A.S.E., 27 6 }	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Turners		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Smiths		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Planers		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32 —	
Ironmoulders	—	—	34 —	34 —	34 —	32 —	32 —	32 —	34 —	34 —	34 —	34 —	32 —	32 —	32 —	
Shipwrights	1830, 18s.	—	—	—	—	—	—	—	—	—	33 —	31 6	31 6	31 6	31 6	
Shipjoiners	—	—	—	—	—	—	—	—	—	—	30 6	—	—	—	—	
Strikers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Sailmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Brass finishers	—	—	—	—	—	—	—	—	30 —	32 —	—	—	—	—	—	
Brassmoulders	1867, 26s.	—	—	—	—	—	—	—	30 —	32 —	—	—	—	—	—	
Mast and block makers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
HALIFAX.																
Ironmoulders	1865, 28s.	—	—	—	—	—	—	—	—	—	—	—	32 —	34 —	34 —	
LEEDS.																
Turners	25s., 1862	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Fitters		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Smiths		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Planers		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30 —	
Ironmoulders	67, 28s., 30s.	—	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	30 —	
LIVERPOOL.																
Fitters	A.S.E. 1865 & 1885	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Turners		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Smiths		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Planers		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ironmoulders	1865, 30s., 32s., 1867, 32s., 34s., 1852, 24s., 1853, 26s., rose to 30s.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Mast and block makers		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Brassmoulders		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Brass finishers		—	—	—	—	—	—	—	32 —	(—)	—	—	32 —	32 —	30 —	30 —
MERSEY.																
Shipjoiners	1853-58, 36s. 1858-60, 20s.	36 36	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	36 —	
Shipwrights		—	—	—	—	—	—	—	—	—	—	—	—	—	—	
LONDON.																
Smiths*	1871, 36s.	36 —	36 —	36 —	36 —	36 —	38 —	38 —	38 —	38 —	38 —	38 —	38 —	38 —	38 —	
Shipjoiners	1865-71, 36s.	36 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	39 —	
Patternmakers	1865, 36s., struck for 39s.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Strikers		—	—	—	—	—	—	—	—	—	—	—	—	—	—	

* From the Bulletin of the U.S.A. Labour

in Engineering and Shipbuilding, 1872-1904.

'86.	'87.	'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99-00.	'01-02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
25 10½	25 10½	28 4½	31 6	32 7½	32 7½	31 6	31 6	31 6	32 7½	34 10½	34 10½	37 1½	37 1½	37 1½	36 -
29 3	29 3	30 4½	33 9	34 10½	34 10½	33 9	32 7½	32 7½	32 7½	34 10½	36 -	37 1½	37 1½	37 1½	36 -
—	—	—	34 10½	34 10½	34 10½	34 10½	34 4	34 4	34 4	35 -	36 -	37 1½	38 3	37 1½	37 1½
—	—	—	—	26 6	29 6	—	27 7½	29 9	29 9	29 9	31 10½	31 10½	31 10½	31 10½	31 10½
25 -	27 -	29 6	30 -	31 -	31 -	29 -	29 -	29 -	29 -	31 -	32 -	34 -	34 -	34 -	33 -
—	—	—	33 -	33 -	33 -	32 -	31 -	31 -	31 -	33 -	35 -	36 -	36 -	36 -	36 -
—	—	—	—	—	—	32 -	31 -	31 -	31 -	33 -	35 -	36 -	36 -	36 -	36 -
—	—	—	—	—	—	32 -	31 -	31 -	31 -	33 -	35 -	36 -	36 -	36 -	36 -
32 -	32 -	34 -	36 -	36 -	36 -	26 -	26 -	26 -	26 -	28 -	30 -	31 -	31 -	31 -	31 -
31 -	34 -	34 -	35 -	36 -	36 -	35 -	34 -	34 -	34 -	36 -	38 -	39 -	39 -	39 -	39 -
31 6	31 6	33 6	34 6	36 6	34 6	34 6	33 6	33 6	33 6	35 6	37 6	37 6	38 6	38 6	38 6
—	30 6	30 6	31 6	33 -	33 -	33 -	33 -	33 -	33 -	35 4	37 6	37 6	38 6	38 6	38 6
—	—	—	—	22 -	22 -	21 6	20 6	—	22 -	23 -	24 4	25 -	25 -	25 -	25 -
—	—	—	30 (	31 6	31 6	31 6	31 6	—	—	—	—	—	—	—	—
—	—	—	33 (	33 -	33 3	33 -	33 -	—	—	—	—	—	—	—	—
—	—	—	32 6	34 6	—	33 -	32 -	32 -	32 -	33 -	35 -	36 -	37 -	37 -	37 -
—	—	—	32 6	34 6	—	32 -	34 -	34 -	34 -	36 -	38 -	39 -	40 -	40 -	40 -
—	—	—	—	—	—	34 6	—	—	32 -	34 -	34 -	34 -	35 -	35 -	35 -
34 -	34 -	31 -	34 -	36 -	36 -	36 -	36 -	36 -	36 -	36 -	38 -	38 -	38 -	38 -	38 -
26 -	26 -	28 -	28 -	30 -	30 -	30 -	30 -	30 -	30 -	32 -	32 -	33 -	33 -	33 -	33 -
27 -	27 -	29 -	29 -	31 -	31 -	31 -	31 -	31 -	31 -	33 -	33 -	34 -	34 -	34 -	34 -
30 -	30 -	31 -	31 6	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	37 -	37 -	37 -	37 -
30 -	30 -	31 -	32 -	34 -	34 -	34 -	34 -	34 -	34 -	36 -	36 -	37 -	38 -	38 -	38 -
—	—	—	—	—	—	34 -	33 -	33 -	33 -	33 -	34 -	34 -	35 6	36 -	36 -
—	—	—	—	—	—	34 -	33 -	33 -	33 -	33 -	34 -	34 -	35 6	36 -	36 -
—	—	—	—	—	—	36 -	35 -	35 -	35 -	35 -	36 -	36 -	37 6	38 -	38 -
32 -	30 -	31 6	32 -	36 -	37 -	37 -	36 -	35 -	35 -	35 -	37 -	37 -	38 6	39 6	39 6
34 -	—	—	34 -	36 -	38 -	38 -	36 -	36 -	36 -	36 -	38 -	38 -	39 -	40 -	40 -
36 -	—	—	—	—	—	—	—	—	—	—	—	40 -	41 -	42 -	42 -
—	—	—	—	37 -	37 -	37 -	37 -	—	—	—	—	—	—	—	—
—	—	—	—	33 -	35 -	35 -	34 -	34 -	34 -	34 -	36 -	37 -	38 -	38 -	38 -
30 -	30 -	32 -	33 -	33 -	33 -	33 -	32 -	32 -	32 -	32 -	34 -	35 -	36 -	36 -	36 -
36 -	36 -	36 -	36 -	36 -	36 -	39 -	39 -	39 -	39 -	39 -	39 -	42 -	42 -	42 -	42 -
38 -	38 -	38 -	38 -	38 -	58 -	40 -	40 -	40 -	40 -	40 -	—	—	—	—	—
39 -	39 -	39 -	39 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -	42 -
39 -	39 -	39 -	39 -	40 -	40 -	40 -	40 -	40 -	40 -	40 -	42 -	42 -	42 -	42 -	43 -
10 6	10 6	10 6	10 6	10 6	10 6	10 6	10 6	10 6	10 6	10 6	12 9	12 9	12 9	12 9	13 9

TABLE 5 (b) *Contd.*—*Trade Union Standard Rates*

	Previous to 1872.	1872	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82.	'83.	'84.	'85.
		s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d.
MANCHESTER.															
Steam engine makers.....	'72, +2s.	—	—	—	—	—	—	—	— 2s	—	—	+2s	—	—	—
Blacksmiths*	—	32	— 32	32	— 32	32	— 34	34	34	— 34	34	34	— 34	34	34
Blacksmiths' strikers*	—	20	— 20	20	— 20	21	21	— 21	21	— 21	21	21	— 21	21	21
Boilermakers' helpers*	—	32	— 32	32	— 32	32	— 32	32	32	— 32	32	32	— 32	32	32
Ironmoulders*	1862 & '67, 34s.	36	— 38	38	— 38	38	38	— 36	36	— 36	38	38	— 38	38	38
Machinists*	1870-71, 30s.	32	— 32	32	— 32	32	32	— 32	32	— 32	32	34	— 34	34	34
Patternmakers*	{ 1865, 32s. 1866, 34s.	36	— 36	36	— 36	36	36	— 36	36	— 36	36	36	— 36	36	38
Fitters and turners.....	1862, 29s. 9d.	—	—	34	— 34	31	34	— 34	32	— 32	34	31	— 34	34	34
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brass finishers	—	—	—	—	—	—	—	—	—	—	(+)	—	—	—	—
Brassmoulders	—	—	—	—	—	—	—	—	—	—	(+)	—	—	—	—
NOTTINGHAM.															
Fitters and turners.....	1862, 27s. 5d.	—	—	32	— 32	32	32	— 32	32	— 32	32	32	— 32	32	32
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	34	— 34	34	34	— 34	34	— 34	34	34	— 34	34	34
Ironmoulders	—	—	34	— 34	31	31	34	— 34	34	— 34	34	34	— 34	34	34
Brassmoulders and finishers	1867, 26s.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
OLDHAM.															
Fitters and turners	{ 52, 28-31 62, 29 65, 31 6 }	—	—	—	—	—	—	—	—	—	—	—	—	—	33
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	36	— 36	36	36	36	— 36	34	— 36	36	36	— 36	36	35
Brass finishers and moulders	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SHEFFIELD.															
Fitters and turners	1862, 28s.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	36	— 36	36	36	36	— 36	31	— 34	36	36	— 36	36	36
SOUTHAMPTON.															
Shipjoiners	1866, 29s.	—	—	—	—	—	—	—	—	—	—	—	—	—	30
Shipwrights	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fitters	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Turners	1862, 32s.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SWANSEA.															
Ironmoulders	1865, 21s.	—	—	—	—	—	—	—	—	—	—	—	—	—	30
Shipjoiners	—	—	—	—	—	—	—	—	—	—	—	—	—	—	33
Patternmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
WOLVERHAMPTON.															
Fitters and turners	{ 1824, 26s. 30s. 1862, 28s.	—	—	30	— 30	30	30	— 30	30	— 30	30	30	— 30	30	30
Patternmakers	—	—	—	32	— 32	32	32	— 32	32	— 32	32	32	— 32	32	32
Smiths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* From the Bulletin of the U.S.A. Labour Department. No. 18. September, 1899. The

in Engineering and Shipbuilding, 1872-1904.

'86.	'87.	'88.	'89.	'90.	'91.	'92.	'93.	'94.	'95.	'96.	'97.	'98.	'99-00.	'01-02.	'03-04.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
— 6	—	+ 2s.	—	—	—	—	—	—	—	—	—	—	—	—	—
34	34	34	32	34	34	34	34	34	34	36	—	—	—	—	—
21	21	21	20	21	21	21	21	21	21	21	—	—	—	—	—
32	32	32	32	32	32	32	32	32	32	32	—	—	—	—	—
38	38	38	38	38	38	38	38	38	38	38	40	40	40	40	40
32	32	32	34	34	35	35	34	34	34	36	—	—	—	—	—
36	36	37 6	38	38	38	38	38	38	38	39	—	—	—	—	—
36	36	37 6	38	38	38	38	38	38	38	40	40	40	40	40	40
32	32	34	34	34	34	34	34	34	34	36	36	36	36	36	36
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	32	34	34	34	34	34	34	34	35	36	36	36	36	36
—	—	32	34	34	34	34	34	34	34	36	36	36	36	36	36
34	34	34	34	34	34	34	34	34	34	34	36	36	36	36	36
36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
34	34	34	34	34	34	34	34	34	34	36	36	36	36	36	36
—	—	—	—	32 6	32 6	—	30	30	30	30	—	—	32	32	32
—	—	—	—	—	—	—	—	—	—	—	—	—	34	34	34
—	—	—	32	32	33	—	32	32	32	33	35	35	35	35	35
—	—	—	—	—	—	—	31	34	34	34	36	36	36	36	36
—	—	—	—	—	—	—	26	26	26	26	28	28	28	28	28
36	36	36	36	36	36	36	36	36	36	36	38	38	38	38	38
—	—	—	28-30	30-32	—	—	32	32	32	32	34	34	34	34	34
—	—	—	—	—	36	36	36	36	36	36	38	38	38	38	38
—	—	—	—	—	38	38	38	38	38	38	38	38	38	38	38
34	35	35	36	36	36	36	36	36	36	36	38	38	38	38	38
36	36	36	36	38	38	38	38	38	38	38	38	39	40	40	40
29	29	29	29	32 6	32 7½	32 7½	32 7½	32 7½	32 7½	34	34	35	36 6	36 6	36 6
—	—	32	32	35	35	35	35	35	35	35	36	36	37 6	37 6	37 6
—	—	—	32	34	34	34	34	34	34	34	36	36	37	37	37
—	—	—	30	32	32	32	32	32	32	34	34	34	35	—	37
33	—	28	30	30	33	33	33	33	33	33	33	33	36	36	36
—	—	33 9	33 9	33 9	33 9	36	36	36	36	36	36	36	39	39	—
—	—	—	33	36	36	36	36	36	36	35	35	35	38 3	38 3	38 3
30	30	30	30	30	30	30	30	30	30	32	32	32	32	32	32
32	32	32	32	32	32	32	32	32	32	34	34	34	34	34	34
—	—	—	—	—	—	—	34	34	34	33	33	33	33	33	33

figures for 1872 also refer to 1870 and 1871. Those for ironmoulders, 1897-1904, are added.

TABLE 6.—*Miscellaneous Statements of Wages in Engineering and Shipbuilding.*

	1770-93.	1794-1800.	1802.		1824-65.	'66.	'67-68.		
LONDON.	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.		
Shipwrights	21 -	31 6	30 -	{ rising to the end of the war }	36 -	42 -	36 -		
Another account says "end of the war" (<i>i.e.</i> , 1815) "to Russian war 39s."; "fluctuated for a time," and "settled after the war at 42s."									
Sailmakers	1816-19, reductions; 1836-50, 30s.								
Engineers	1824, 36s., rising to 24s. for good men; 1830 and '36, 36s.								
Smiths	1816, 36s.								
Labourers	1824, 18s.; 1831, 18s.-21s.								
Ironmoulders	1848, 36s.								
<hr/>									
	1795.	1815.	'16.	'17.	'19.	'20-24.	'25-26.	'27-38.	'39-50.
LIVERPOOL.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Shipwrights	24 -	33 -	{ 30 - 33 - }	30 -	24 -	27 -	30 -	27 -	30 -
Shipjoiners	1816, rose from 24s. to 27s.								
<hr/>									
	1810.	'21.	'39.	(Apparently no change 1824-39.)					
DUBLIN.	s. d.	s. d.	s. d.						
Shipwrights	{ 20 - 27 - }	27 -	27 -						
<hr/>									
	1795.	1800.	'05.	'13.	'19.	'21.	'24.	'32.	'33.
MANCHESTER.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Mechanics	18 -	21 -	24 -	{ 28 - 30 - }	22 - 24 -	26 - 28 -	30 -	{ 26 - 30 - }	27 - 31 -
<hr/>									
	1810.	'11.	'12.	'13.	'14.	'15.	'16.	'17.	
IRONMOULDERS.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Whitesmiths	31 3	28 -	27 4	31 6	32 3	32 1	34 8	33 8	
<hr/>									
	1810.	'11.	'12.	'13.	'14.	'15.	'16.	'17.	
IRONMOULDERS.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Whitesmiths	25 -	25 -	25 -	25 -	25 -	25 -	25 -	25 -	25 -
<hr/>									
	1818.	'19.	'21.	'22.	'23.	'24.	'25.	'32.	'33.
IRONMOULDERS.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Whitesmiths	35 10	34 6	30 6	30 6	30 -	30 -	30 -	28, 30,	29 c
<hr/>									
	1824.	'26.	'27.	'28.	'29.	'30.	'31.	'32.	
BRADFORD.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Mechanics in mills	27 2	26 9	27 8	27 4	25 6	24 8	24 9	25 -	

TABLE 6 *Contd.*—*Miscellaneous Statements of Wages.*

	1821-22.	'23.	'24.	'25.	'26.	'27-28.	'29.	'30.	'31-32.	'33.	'34.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
LONDONDERRY.											
Shipwrights	24 -	24 -	24 -	22 -	22 -	22 -	20 -	20 -	20 -	21 -	21 -
Rope and sail- makers	13 6	13 6	13 6	13 6	13 6	11 -	11 -	11 -	11 -	11 -	12 -
Coppersmiths	21 -	20 -	20 -	20 -	20 -	20 -	20 -	18 -	18 -	18 -	18 -
Whitesmiths	18 -	18 -	18 -	18 -	17 -	17 -	16 -	15 -	15 -	15 -	15 -
Blacksmiths	12 6	12 -	12 -	11 -	11 -	11 -	11 -	11 -	10 -	10 -	10 -
Labourers	10 -	10 -	9 -	9 -	9 -	9 -	8 -	8 -	8 -	8 -	8 -

	1812.	'19.	'26.	'33.	'42.	'97-1902.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
ARBROATH.						
Founders.....	21 -	21 -	20 -	21 -	—	36 -
Smiths.....	16 -	20 -	16 -	15 -	—	29 -
Millwrights	12 -	20 -	17 -	15 -	20 -	27 -

	1836.	'51.	'76-86.
	<i>s. d.</i>	<i>s. d.</i>	
ABERDEEN—			
Engineers	15 -	—	—
DUNDEE—			
Engineers	15 -	20 -	{ Have been 32s. for 54 hours and 31s. for 51 hours.
		1832-50, 16s., 18s.	
NORTHUMBERLAND—	1836.		
Engineers	18, 20	—	—
NORTH OF ENGLAND—			
Engineers	20 -	—	—
LANCASHIRE—	1840.		
Engineers	24, 25	—	—
EDINBURGH—	1836-46.		
Millwrights	23 -	—	—
Fitters and turners	18, 20	—	—
SHEFFIELD—	1832.		
Ironfounders	24 -	—	—

IV.—*Prices of Commodities in 1904.* By A. SAUERBECK.

THE following table shows the course of prices of forty-five commodities during the last twenty years as compared with the standard period of eleven years, 1867-77, which in the aggregate is equivalent to the average of the twenty-five years 1853-77 (see the *Society's Journal*, 1886, pp. 592 and 648, and 1893, pp. 220 and 247).

Summary of Index Numbers. Groups of Articles, 1867-77 = 100.

	Vegetable Food (Corn, &c.),	Animal Food (Meat, &c.),	Sugar, Coffee, and Tea,	Total Food,	Minerals,	Textiles,	Supplementary Materials,	Total Materials,	Grand Total	Silver,*	Wheat Harvest,†	Average Price of Consols,‡	Average Bank of England Rate,‡
1885	68	88	63	74	66	65	76	70	72	79.9	108	99½	3
'86	65	87	60	72	67	63	69	67	69	74.6	93	100¾	3
'87	64	79	67	70	69	65	67	67	68	73.3	110	101¾	3 ² / ₁₀
'88	67	82	65	72	78	64	67	69	70	70.4	96	101	3 ³ / ₁₀
'89	65	86	75	75	75	70	68	70	72	70.2	103	98	3 ⁶ / ₁₀
1890	65	82	70	73	80	66	69	71	72	78.4	106	96½	4 ⁵ / ₁₀
'91	75	81	71	77	76	59	69	68	72	74.1	108	95¾	3 ³ / ₁₀
'92	65	84	69	73	71	57	67	65	68	65.4	91	96¾	2 ¹ / ₁₀
'93	59	85	75	72	68	59	68	65	68	58.6	90	98½	3 ¹ / ₁₀
'94	55	80	65	66	64	53	64	60	63	47.6	106	101	2 ¹ / ₁₀
1895	54	78	62	64	62	52	65	60	62	49.1	91	106½	2
'96	53	73	59	62	63	54	63	60	61	50.5	116	111	2 ⁵ / ₁₀
'97	60	79	52	65	66	51	62	59	62	45.3	100	112¼	2 ⁶ / ₁₀
'98	67	77	51	68	70	51	63	61	64	44.3	120	111	3¼
1899	60	79	53	65	92	58	65	70	68	45.1	113	107	3¼
1900	62	85	54	69	108	66	71	80	75	46.4	99	99½	4
'01	62	85	46	67	89	60	71	72	70	44.7	106	94	3¼
'02	63	87	41	67	82	61	71	71	69	39.6	113	94½	3 ³ / ₁₀
'03	62	84	44	66	82	66	69	72	69	40.7	104	90¾	3½
'04	63	83	50	68	81	71	67	72	70	43.4	93	88¼	3 ³ / ₁₀
Average 1895-1901	61	81	51	66	80	59	67	68	67	44.9	106	101½	3¼
'88-97....	62	81	66	70	70	59	66	65	67	61.0	101	101¾	2 ⁹ / ₁₀
'85-91....	65	83	68	72	71	62	68	67	69	69.2	101	99	3 ¹ / ₁₀
'78-87....	79	95	76	81	73	71	81	76	79	82.1	97	99½	3 ² / ₁₀

* Silver 65.84*d.* per oz. = 100.

† Wheat harvest in the United Kingdom, 29 bushels = 100.

‡ Consols and bank rate actual figures, not index numbers; consols 2½ per cent. from 1889 2½ per cent. from April 1903.

The index number of all commodities was 70 last year, or one point higher than in the two preceding years, though a more exact calculation with a decimal added would have made it 70·3, against 69·5 in 1903 and 1902. It was about 30 per cent. below the standard period 1867-77, and 11½ per cent. below the ten years 1878-87, but about 5 per cent. *above* the average of the last ten years.

Textiles, sugar, and corn were on the *average* higher, animal food products, minerals and sundry materials lower, than in the previous year.

The monthly fluctuations were as follows:—

December, 1889.....	73·7	December, 1902....	69·1	June, 1904....	69·4
February, '95.....	60·0	" '03	70·0	July, "	69·9
July, '96.....	59·2	January, '04....	70·4	August, "	70·4
December, '98....	63·8	February, "	70·8	September, "	70·7
July, 1900....	76·2	March, "	70·8	October, "	71·0
December, "	73·4	April, "	70·5	November, "	71·2
" 1901....	68·4	May, "	69·9	December, "	70·9

The movements in the aggregate, as illustrated by the index number, have not varied to any great extent during last year. A slight improvement at the beginning was followed by weakness in the summer and greater firmness towards the end.¹

Taking articles of food and materials separately, the index numbers compare thus (1867-77 = 100):—

	Average.			Dec., 1889.	Feb., 1895.	July, 1896.	Feb., 1900.	Dec., 1902.	Dec., 1903.	Dec., 1904.
	1878-87	1885-94.	1895-1904							
Food	84	72	66	73·1	63·8	60·0	65·8	66·2	65·3	69·1
Materials	76	67	68	74·2	57·0	58·6	81·9	71·3	73·4	72·3

Articles of food were nearly 6 per cent. *higher*, materials 1¼ per cent. *lower* than in December, 1903.

The position of the six separate groups of commodities at the end of the last three years in comparison with whole periods, is illustrated by the following index numbers (1867-77 = 100):

	Average.			Dec., 1902.	Dec., 1903.	Dec., 1904.	Last Year, per Cent.
	1878-87.	1885-94.	1895-1904				
Vegetable food, } corn, &c.	79	65	61	61·9	61·6	63·1	rise 3
Animal food (meat } and butter)	95	83	81	81·7	80·7	82·6	" 2½
Sugar, coffee, and tea	76	68	51	42·2	45·7	57·5	" 26
Minerals	73	71	80	82·3	82·0	85·6	" 4½
Textiles.....	71	62	59	62·1	70·5	66·6	fall 5½
Sundry materials.....	81	68	67	70·9	70·1	67·9	" 3

¹ In January, 1905, the index number was 70·2, and in February, 70·4.

Corn, especially wheat, ruled higher, owing to unfavourable crops, while potatoes, rather dear in the early part of the year, were on a low level for the new season's produce. Beef and mutton improved up to the middle of the year, but lost part of the advance later on; they were, however, still higher than at the end of 1903. Pork and bacon, on the other hand, were cheaper. In the third group there was a very important rise, principally due to sugar. German beet sugar was worth 8s. 5*d.* per cwt. f.o.b. at the end of 1903, and less than 8s. in January and February; it gradually rose to 11s. in September, but in consequence of the reduced beet sugar crop in Europe, estimated to show a reduction of more than a million tons, great speculation ensued, carrying the price to 14s. 5*d.* at the end of the year. Java sugar rose from 9s. 6*d.* per cwt. at the end of 1903 to 15s. 6*d.*, and French loaves from 12s. 9*d.* per cwt. f.o.b. to 18s. 3*d.* Santos coffee rose from 35s. 3*d.* per cwt. at the end of 1903 to 40s. in February, but receded to 31s. 6*d.* in May; a gradual improvement occurred afterwards, and the closing price was 39s. 6*d.* Tea remained on a low basis, and inferior and medium sorts suffered a distinct decline.

The average prices of metals were nearly the same as in the previous year, but coal was somewhat cheaper. Cleveland iron was quoted 42s. 7*d.* per ton at the beginning of the year, and fluctuated between 42s. and 44s. until October; it improved in November and December, and was worth 50s. 9*d.* at the end. Copper, quoted 56½*d.* per ton at the end of 1903, had only moderate fluctuations during the first eight months, but rose afterwards, and stood at 68½*d.* at the end. Tin declined from 132¾*d.* per ton to about 117½*d.* in June, was firmer afterwards, and rose since September, being finally quoted 134¼*d.* Lead was worth 12½*d.* per ton, against 11½*d.* at the end of 1903. Best house coal in London fell from 17s. a ton to 14s. in midsummer, but returned again to the opening quotation of 17s. Newcastle steam coal closed at 9s., against 9s. 6*d.* in 1903. The average export value of coal was 11s. 1½*d.* per ton, against 11s. 8*d.* in 1903 and 16s. 9*d.* in 1900.

Among textiles we had almost disastrous movements for cotton. American middling stood at 6·96*d.* per lb. at the end of the previous year, and the great speculation carried the price to 9*d.* in February. By the end of September it had fallen to 5·80*d.* A further decline occurred when estimates of an unprecedented American crop were published, of 12 million bales in November and of 13 million bales or more in December, until the lowest price was touched on 30th December, viz., 3·63*d.* The quotation on 31st December was 3·77*d.* per lb. Flax ruled higher during the greater part of the year, but gave way at the end. Hemp and jute advanced. Fine wool had only a small improvement, but coarse wool, including the home produce, rose from 35 to 50 per cent. Silk declined, but improved again to some extent at the end.

In the group of sundry materials hides were higher, while tallow was lower on the average, and linseed oil and petroleum experienced a reduction.

Quarterly Movements of Prices.*

Summary of Index Numbers, 1867-77 = 100.

Years.	Quar- ters.	Vege- table Food (Corn, &c.).	Animal Food (Meat, &c.).	Sugar, Coffee, and Tea.	Total Food.	Min- erals.	Tex- tiles.	Sundry Mate- rials.	Total Mate- rials.	Grand Total.	Silver.†
1889....	IV	66.3	86.0	67.2	73.1	83.9	70.7	68.1	73.2	73.2	71.4
'98....	IV	62.4	76.8	52.3	65.6	75.0	50.4	63.3	62.5	63.8	45.5
'99....	IV	59.6	77.4	53.6	64.8	98.8	68.7	68.7	76.8	71.8	44.5
1900	I	60.2	80.2	53.4	66.2	107.9	70.6	72.1	81.3	74.9	45.3
	II	62.3	87.5	55.0	70.0	108.6	65.4	71.4	79.6	75.6	45.6
	III	64.0	86.1	55.9	70.5	111.0	64.5	71.1	79.8	75.9	47.0
	IV	63.7	85.3	52.3	69.3	105.5	60.9	71.5	77.4	74.0	48.8
'01	I	62.5	87.4	48.6	68.7	94.0	60.3	70.6	73.7	71.6	45.7
	II	63.4	85.2	46.5	67.9	88.5	59.5	70.9	72.1	70.3	44.9
	III	61.5	85.8	43.8	66.7	86.7	59.6	71.1	71.7	69.6	44.3
	IV	62.3	84.1	42.3	66.1	83.9	58.2	72.2	71.0	69.0	42.6
'02	I	62.0	84.3	41.3	65.8	82.2	59.6	72.8	71.3	69.0	41.5
	II	63.5	90.5	39.6	68.5	83.2	60.3	72.7	71.7	70.3	39.2
	III	63.2	89.2	39.2	67.7	82.6	61.7	70.3	71.0	69.6	39.6
	IV	61.9	84.9	41.7	66.1	82.3	61.7	70.1	70.8	68.8	37.0
'03	I	61.6	86.9	42.6	67.0	85.7	63.7	70.2	72.4	70.0	36.6
	II	62.5	84.1	42.9	66.4	82.9	65.6	69.2	71.8	69.5	40.1
	III	64.0	85.0	43.2	67.3	81.0	65.9	68.7	71.2	69.5	43.6
	IV	61.7	81.7	45.1	65.6	80.3	67.9	69.9	72.1	69.3	43.8
'04	I	63.7	79.9	45.3	65.8	82.0	74.0	69.5	74.2	70.7	42.8
	II	62.9	84.7	48.1	67.8	79.9	70.2	66.9	71.4	69.9	42.0
	III	63.5	85.8	50.1	68.9	79.5	70.5	66.8	71.3	70.3	43.7
	IV	63.4	83.4	55.3	69.1	84.7	68.4	67.6	72.5	71.0	45.2

* The four quarterly figures of each year do not in all cases exactly (in the decimals) agree with the annual averages, as the latter are partly calculated from revised figures. See also the Society's *Journal*, 1893, p. 221; 1895, p. 144; and 1901, p. 90.

† Silver 60.84d. per oz. = 100.

The quarterly numbers show the average of three monthly figures, and by thus eliminating minor fluctuations they give a more reliable comparison of the gradual changes of the various groups of commodities. Last year's figures indicate the higher prices for meat in the second and third quarter, and the advance of sugar in the second half of the year, the sharp rise for minerals in the last quarter, the high level of textiles in the first quarter, and the decline afterwards, principally influenced by the strong movements of cotton.

The following figures show in each case the average index numbers of all the forty-five commodities for ten years (see the dotted line in the diagram of the *Journal*, 1886, and also the *Journal*, 1893, p. 220); they give the best picture of the gradual movement of the average prices of *whole periods*, as the ordinary fluctuations are still further obliterated:—

1818-27 = 111	1882-91 = 74	1889-98 = 66
'28-37 = 93	'83-92 = 72	'90-99 = 66
'38-47 = 93	'84-93 = 71	'91-1900 = 66
'48-57 = 89	'85-94 = 69	'92-'01 = 66
'58-67 = 99	'86-95 = 68	'93-'02 = 66
'68-77 = 100	'87-96 = 68	'94-'03 = 66
'78-87 = 79	'88-97 = 67	'95-'04 = 67

From the decade 1889-98 the average of ten years had remained 66, but has now advanced again to 67.

Silver.—The average price was $26\frac{3}{4}d.$ per oz. against $24\frac{3}{4}d.$ in 1903. The lowest price on record was $21\frac{1}{16}d.$ per oz. (index number 35.6) in November, 1902; the price at the end of 1903 was $26\frac{1}{2}d.$ per oz. (index number 42.9). The metal declined to $25d.$ per oz. in March, and gradually rose later on, touching the highest price in December, viz., $28\frac{3}{4}d.$ per oz. The closing price was $28\frac{3}{4}d.$ per oz. (index number 46.6). The good demand for India continued during 1904, and towards the end the price was also influenced by the purchase of Mexican dollars, to be returned to Mexico before the introduction of the currency reform.

Gold.—The production in 1899 was estimated at 63,000,000*l.*, in 1900 at 52,000,000*l.*, in 1901 at 54,000,000*l.*, in 1902 at 61,000,000*l.*, in 1903 at 67,000,000*l.*, and the total in 1904 has probably exceeded 70,000,000*l.*

The *rate of discount* in the three principal markets is shown in the following table:—

[Per cent. and two decimals.]

	London.		Paris.		Berlin.		Average of the Three Markets.	
	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1895	2.00	0.80	2.10	1.59	3.14	2.02	2.41	1.47
'96	2.50	1.40	2.00	1.75	3.66	2.99	2.72	2.05
'97	2.60	1.80	2.00	1.81	3.81	3.09	2.80	2.23
'98	3.25	2.60	2.20	2.07	4.27	3.55	3.24	2.74
'99	3.75	3.25	3.06	2.96	5.04	4.45	3.95	3.55
1900	4.00	3.70	3.25	3.17	5.33	4.41	4.19	3.76
'01	3.75	3.14	3.00	2.48	4.10	3.06	3.62	2.89
'02	3.30	2.96	3.00	2.43	3.32	2.19	3.21	2.53
'03	3.75	3.24	3.00	2.78	3.84	3.01	3.53	3.01
'04	3.30	2.65	3.00	2.23	4.22	3.13	3.51	2.67

The average rates in 1895 were the lowest on record, those in 1900 were the highest since 1873. After a reduction in 1901 and 1902, the market rates in 1903 were on the average $\frac{1}{2}$ per cent. higher than in 1902, but last year's figure was $\frac{1}{3}$ per cent. lower than in 1903.

A *review of the past year* will still have to record more unsatisfactory points in the general state of trade than the reverse,

though some change for the better has been witnessed towards the close. Particularly in this country the complaints about slackness of trade and reduced spending power of the masses have been pretty general, and the statistics of the percentage of the unemployed have been the worst since the beginning of 1895. The iron trade was not good, and the shipbuilding industry was not described as satisfactory, although practically the same tonnage was turned out. The cotton industry suffered again from the gigantic speculations in America, and for the greater part of the year spinners and manufacturers had to contend with the greatest difficulties. The fall of cotton prices in the last quarter, and the abundance of cheap raw material relieved the situation, and the industry is now fully and profitably employed. The woollen industry was also handicapped by the scarcity of the raw material, and rising prices at the time when extra orders for the Far East had to be executed. The flax and jute industries were in the same way affected by high prices of the raw articles. The wheat and barley harvests were smaller, and agriculturists were compensated only to a small extent by the better quality and higher prices for corn, and the still high level of meat values. A great contrast to the home trade generally has been the external trade of the country, which has even topped the record year 1903 by over 19,000,000/., of which about 8,000,000/., were due to higher prices, and about 11,000,000/., to larger quantities. The total exceeded 922,000,000/., (excluding bullion).

In Germany the gradual but slow improvement recorded for 1903 has made steady progress, and the position is much better, though still greatly distant from what it was during the prosperous years before 1901. In the United States there was an important recovery in trade during the last four months.

The wheat harvest of the world was smaller, owing to reductions in the United States and some European countries; the iron production, both in the United States and in Great Britain, has fallen off, but remained on its previous level in Germany; sugar of the new season shows a considerable decrease; but cotton, after a decrease in the last season's supplies, has produced now an enormous crop. The production of wool was much smaller last year, but some increase is now expected.

The depression of gilt-edged securities continued throughout the greater part of the year, and the average price of consols was 88½ per cent., against 90¾ in 1903; the lowest price was about 85¼ at the beginning of March, and the closing price was 88¾, against 88 at the end of 1903. The figures given by the *Bankers' Magazine* of a large number of securities combined show that the lowest point was in February, and that since then the rise amounted to nearly 5 per cent., but the average totals for the whole year are still about 2 per cent. lower than in 1903. American railway securities had a great rise, and considerable fluctuations in the course of the year, and there was also an improvement in British and South American railway shares.

The war between Russia and Japan, and the fear at certain

periods of other complications, had naturally their influence, particularly on the bourses; but while trade in Russia is in a very depressed state, the industries of other countries had the advantage of being employed by the belligerents for their manifold requirements. This will continue so long as the war lasts, and the return of peace will still further stimulate their wants, as the destruction of materials, armaments, and ships will cause large orders to be given for immediate renewals. Independent of the war itself, the darkest point is still the vast expenditure by most Governments and municipalities, and the new loans to be issued. This may perhaps make the money rates less easy than might otherwise be expected from gradual savings and the increase of the gold production.

In India and Argentina prosperity continues, and Australia is rapidly recovering from the ravages of the drought; to these three countries, and to China and Japan, a great part of the increase in our exports has been directed, and a further extension of business is almost certain. The United States and Germany appear to have got over their troubles, and altogether there seem to be indications that the prospects of trade are more hopeful than they have been for some years past.

The arithmetical mean of the forty-five index numbers, which is 70 against 69 in 1903 (or more exactly 70·3 against 69·5, has, as in former years, again been subjected to two tests:—

Firstly, by using the same index numbers of the separate articles, but calculating each article according to its importance in the United Kingdom on the average of the three years 1899-1901, when the mean for 1904 is 70·4, against 69·1 in 1903; or, on the average of the five years 1871-75, when the mean for 1904 is 70·2, against 68·6 in 1903.

Secondly, by calculating the quantities in the United Kingdom at their actual values (the production on the basis of my price tables, the imports at Board of Trade values, and consequently a considerable portion according to a different set of prices) and at the nominal values on the basis of the average prices from 1867-77. In this case the mean is 70·6, against 71·0 in 1903.

In the second calculation the figures for 1902 and 1903 were somewhat higher than the ordinary index numbers, which was principally due to the high export prices of coal, but partly also to the declared values of imports having been rather higher than market prices. These differences have now found a correction, and as the export price of coal—an article of enormous importance in these tables—was lower, while the large potato crop is being sold on a greatly reduced price basis, the ratio of values comes out lower than in the two preceding years.

The following table gives the figures which have served for the second test (see also the Society's *Journal*, 1886, pp. 613—19):—

Movements of Forty-five Commodities in the United Kingdom (Production and Imports).

	Estimated Actual Value in each Period.	Nominal Values at Average Prices of 1867-77, showing Increase in Quantities.	Movement of Quantities.		Movement of Quantities from Period to Period.	Ratio of Prices according to this Table, 1867-77 = 100.
			1848-50 = 100.	1871-75 = 100.		
	Mln. £'s and dec.	Mln. £'s and dec.				
Ave. 1848-50...	219·8	294·8	100	56	—	74·6
.. '59-61....	350·1	382·7	130	73	30% over 1849	91·5
.. '69-71....	456·6	484·6	164	92	27% „ '60	94·2
.. '71-75....	548·8	526·3	178	100	—	104·3
.. '74-76....	537·8	538·4	183	102	—	99·9
.. '79-81 ...	489·7	578·5	196	110	19% over 1870	84·6
.. '84-86....	445·7	610·1	207	116	—	73·0
.. '89-91....	504·1	685·2	233	130	18% over 1880	73·6
.. '94-96	453·7	723·5	245	137	—	62·7
.. '99-1901	562·2	775·5	263	147	13% over 1890	72·5
1902.....	562·7	785·5	266	149	} 2% over 1900 {	71·6
'03.....	558·0	785·3	266	149		71·c
'04*	560·5	793·8	269	151		70·6

* 1904 subject to correction after publication of the complete mineral produce returns.

The nominal values at the uniform prices of 1867-77 show the exact movements of quantities in the aggregate. Last year's total is about 1 per cent. larger than in the previous year. The increase on 1889-91 amounts to 16 per cent., and it is 51 per cent. on 1871-75, and 169 per cent. on 1848-50.

The price movements of the external trade of this country—total imports into the United Kingdom and exports of British and Irish produce—were as follows, 1873 called 111 in accordance with my index number:—

	Total Imports into United Kingdom and Exports of British and Irish Produce.			Ratio of Values. 1873 = 111.	
	Declared Value.	Value at Prices of Preceding Year.	Values* at Prices in 1873.	British Trade.	My Arithmetical Index Numbers.
	Mln. £'s	Mln. £'s.	Mln. £'s.		
1873	626·0	—	626	111·0	111
'83	667·0	—	861	86·0	82
'84	623·0	—	844	81·9	76
'85	584·0	—	835	77·7	72
'86	562·5	—	858	72·8	69
'87	583·3	588·6	898	72·1	68
'88	620·3	609·4	938	73·4	70
'89	675·3	661·5	1,005	74·6	72
'90	684·4	672·7	1,001	75·9	72
'91	683·0	684·8	1,001	75·7	72
'92	651·0	681·4	999	72·3	68
'93	623·6	635·7	976	70·9	68
'94	624·7	666·5	1,043	66·5	63
'95	642·9	666·6	1,112	64·1	62
'96	681·7	671·5	1,162	65·1	61
'97	685·6	689·5	1,176	64·7	62
'98	704·0	703·1	1,201	64·8	64
'99	749·7	724·7	1,241	67·1	68
1900	815·1	739·1	1,224	73·9	75
'01	802·7	836·9	1,256	70·9	70
'02	812·4	831·9	1,302	69·3	69
'03	833·8	826·5	1,323	69·9	69
'04	852·2	847·0	1,345	70·3	70

* 1883-86 calculated by the Board of Trade ("Report on Recent Changes in the Prices of Exports and Imports, 1888"), 1887-1904, nominal figures in proportion with the ratio in the next column. This ratio is based on the figures in the first two columns, published by Mr. S. Bourne and the *Economist*, showing the trade movements and variations in value from year to year, viz., values as returned and calculated at prices of previous year (1887—583·3 : 72·7704 = 588·6 : 72·1152 ; 1888—620·3 : 72·1152 = 609·4 : 73·4051, &c.).

In the above statement all figures previously published are repeated, as they may be of special interest at the present time. The third column at uniform prices shows the movements of quantities, and it will be seen that since 1873, a year in which the external trade was already unusually heavy, the total quantities have increased by about 115 per cent. The ratio of prices in this calculation is 70·3 for 1904, or exactly the same as my index number with the decimal added. The influence of coal is much smaller in this table, as it comprises only the exports and not the total production.

Construction of the Tables.

The Table of *Index Numbers* is based on the average prices of the eleven years 1867-77, and the index numbers have been calculated in the ordinary arithmetical way ; for instance, English wheat :—

	<i>s.</i>	<i>d.</i>	
Average, 1867-77....	54	6	= 100, average point.
„ '55	74	8	= 137, or 37 per cent. above the average point.
„ 1904	28	4	= 52, „ 48 „ below „

The index numbers therefore represent simple percentages of the average point.

Certain articles which appear to have something in common have been grouped together, with the following result :—

		Example for 1904.	
		Total Numbers.	Average.
1. Vegetable food, corn, &c. (wheat, flour, barley, oats, maize, potatoes, and rice)	With 8 Index Nos.	503	63
2. Animal food (beef, mutton, pork, bacon, and butter).....			
3. Sugar, coffee, and tea			
1—3. <i>Food</i>	„ 19 „	1,286	68
4. Minerals (iron, copper, tin, lead, and coal)	„ 7 „	571	81
5. Textiles (cotton, flax, hemp, jute, wool, and silk)			
6. Sundry materials (hides, leather, tallow, oils, soda, nitrate, indigo, and timber)			
4—6. <i>Materials</i> ..	„ 11 „	737	67
1—6. <i>Materials</i> ..	„ 26 „	1,875	72
<i>General average</i>	„ 45 „	3,161	70

The *general average* is drawn from all forty-five descriptions, which are treated as of equal value, and is the simple arithmetical mean as shown above.

Average Prices of Commodities.*

No. of Article	0	1	2	3	4	5	6	7	8	1-8	9	10
		Wheat.		Flour.	Barley.	Oats.	Maize.	Potatoes.*	Rice.	Vegetable Food.	Beef.†	
Year.	Silver.†	English Gazette.	American.	Town Made White.	English Gazette.	English Gazette.	American Mixed.	Good English.	Rangoon Cargoes to Arrive.	Total	Prime.	Midling.
	d. per oz.	s. and d. per qr.	s. and d. per qr.	s. per sack (280 lbs.).	s. and d. per qr.	s. and d. per qr.	s. per qr.	s. per ton	s. and d. per cwt.		d. per 8 lbs.	d. per 8 lbs.
1890	47 $\frac{11}{16}$	31.11	35.6	29	28.8	18.7	20	70	7.3	—	47	38
'91	45 $\frac{1}{16}$	37	40	33	28.2	20	28	92	7.11	—	47	40
'92	39 $\frac{3}{16}$	30.3	33	28	26.2	19.10	21 $\frac{3}{4}$	70	7.8	—	47	38
'93	35 $\frac{3}{16}$	26.4	27.6	26	25.7	18.9	20	65	6.2	—	48	39
'94	28 $\frac{15}{16}$	22.10	23.6	22	24.6	17.1	20	70	5.10	—	47	37
1895	29 $\frac{7}{8}$	23.1	25.6	23	21.11	14.6	19 $\frac{1}{2}$	80	5.6	—	47	37
'96	30 $\frac{3}{4}$	26.2	29	25	22.11	14.9	15	55	6.2	—	45	34
'97	27 $\frac{9}{16}$	30.2	34.6	30	23.6	16.11	14 $\frac{3}{4}$	70	6.9	—	47	36
'98	26 $\frac{15}{16}$	34	37	33	27.2	18.5	17 $\frac{3}{4}$	82	7.2	—	46	36
'99	27 $\frac{7}{16}$	25.8	30	26 $\frac{1}{2}$	25.7	17	18	70	7.2	—	49	40
1900	28 $\frac{1}{8}$	26.11	31.6	27 $\frac{1}{2}$	24.11	17.7	20 $\frac{1}{4}$	78	7.4	—	51	42
'01	27 $\frac{3}{16}$	26.9	30	26 $\frac{1}{2}$	25.2	18.5	22 $\frac{1}{4}$	78	6.7	—	49	42
'02	24 $\frac{1}{16}$	28.1	30.6	26	25.8	20.2	25	69	6.2	—	54	47
'03	24 $\frac{5}{8}$	26.9	31	27	22.8	17.2	22	84	7.3	—	48	42
'04	26 $\frac{1}{8}$	28.4	33.6	28 $\frac{1}{2}$	22.4	16.4	21 $\frac{1}{2}$	90	6.7	—	48	42
Average...												
1895-1904	27 $\frac{1}{4}$	27 $\frac{1}{2}$	31	27	24	17	19 $\frac{1}{2}$	76	6 $\frac{3}{4}$	—	48 $\frac{1}{2}$	40
'88-97	37	29	32	27 $\frac{1}{2}$	25 $\frac{1}{2}$	17 $\frac{1}{2}$	20 $\frac{1}{4}$	73	6 $\frac{3}{4}$	—	47	37 $\frac{1}{2}$
'78-87	50	40	43 $\frac{1}{2}$	34 $\frac{1}{2}$	31 $\frac{1}{2}$	21	25	102	8	—	55 $\frac{1}{2}$	46
'67-77	58 $\frac{1}{2}$	54 $\frac{1}{2}$	56	46	39	26	32 $\frac{1}{2}$	117	10	—	59	50

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1890	78.4	59	63	63	73	72	61	60	72	523	80	76
'91	74.1	68	71	72	72	77	86	79	79	604	80	80
'92	65.4	56	59	61	67	76	67	60	77	523	80	76
'93	58.6	48	50	54	66	72	61	56	62	469	81	78
'94	47.6	41	42	48	63	66	61	60	58	439	80	74
1895	49.1	42	46	50	56	56	60	68	55	433	80	74
'96	50.5	48	52	54	59	57	46	47	62	425	76	68
'97	45.3	55	62	65	60	65	45	61	67	480	80	72
'98	44.3	62	66	72	70	71	55	70	72	538	78	72
'99	45.1	47	54	58	66	65	55	60	72	477	83	80
1900	46.4	49	56	60	64	68	62	67	73	499	86	84
'01	44.7	49	54	58	65	71	68	67	66	498	83	84
'02	39.6	52	54	56	66	78	77	59	62	504	92	94
'03	40.7	49	55	59	59	66	67	72	72	499	81	84
'04	43.4	52	60	62	57	63	66	77	66	503	81	84

* The annual prices are the averages of twelve monthly or fifty-two weekly quotations potatoes of eight monthly quotations, January to April and September to December.

† Index numbers of silver as compared with 60.84d. per ounce being the parity between gold and silver at 1 : 15 $\frac{1}{2}$; not included in the general average.

‡ Meat (9-13), by the carcase, in the London meat market.

Average Prices of Commodities—Contd.

No. of Article }	11	12	13	14	15	9-15	16A	16B	17	18A*	18B*	18
	Mutton.		Pork.	Bacon.	Butter.		Sugar.			Coffee.		
Year.	Prime.	Mid- dling.	Large and Small, Average.	Water- ford.	Fries- land, Fine to Finest.	Animal Food. Total.	British West Indian Refining	Beet, German, SS p. c., f.o.b.	Java, Floating Cargoes.	Ceylon Plantation, Low Mid- dling.	Rio, Good Channel.	Mean of 18A and 18B.
	d. per 8 lbs.	d. per 8 lbs.	d. per 8 lbs.	s. per cwt.	s. per cwt.		s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	
'90	59	45	42	62	100	—	13	12 $\frac{1}{2}$	15 $\frac{1}{4}$	101	83	—
'91	53	42	39	63	106	—	13 $\frac{1}{2}$	13 $\frac{1}{2}$	15 $\frac{1}{2}$	101	76	—
'92	53	42	48	68	108	—	13 $\frac{1}{2}$	13 $\frac{3}{4}$	16	104	68	—
'93	53	42	50	68	106	—	14 $\frac{1}{4}$	15	17 $\frac{1}{4}$	103	81	—
'94	55	42	44	59	98	—	11 $\frac{1}{4}$	11 $\frac{1}{4}$	13 $\frac{3}{4}$	102	75	—
'95	58	44	37	54	93	—	10	10	12	98	74	—
'96	53	39	35	50	98	—	10 $\frac{3}{4}$	10 $\frac{1}{2}$	12 $\frac{1}{2}$	95	58	—
'97	55	41	44	59	94	—	9 $\frac{1}{4}$	8 $\frac{7}{8}$	11	95	40	—
'98	52	37	45	58	95	—	9 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{3}{4}$	92	32	—
'99	54	41	40	51	103	—	10 $\frac{1}{2}$	10	12 $\frac{1}{4}$	90	31	—
900	59	45	44	60	102	—	11 $\frac{1}{4}$	10 $\frac{1}{2}$	12 $\frac{3}{4}$	75	40	—
'01	54	44	49	63	105	—	9 $\frac{1}{4}$	8 $\frac{1}{2}$	10 $\frac{3}{4}$	70	35	—
'02	55	44	48	63	102	—	7 $\frac{1}{4}$	6 $\frac{3}{4}$	8 $\frac{1}{2}$	70	31	—
'03	58	47	44	60	100	—	8 $\frac{1}{2}$	8 $\frac{1}{4}$	9 $\frac{1}{2}$	70	30	—
'04	59	50	39	57	102	—	10 $\frac{1}{4}$	10 $\frac{1}{4}$	11 $\frac{1}{2}$	75	37	—
Average												
895-1904	55 $\frac{1}{2}$	43	42 $\frac{1}{2}$	57 $\frac{1}{2}$	99	—	9 $\frac{3}{4}$	9 $\frac{1}{2}$	11 $\frac{1}{4}$	83	41	—
'88-97.....	56	43 $\frac{1}{2}$	42	61	100	—	12 $\frac{1}{2}$	12 $\frac{1}{2}$	14 $\frac{3}{4}$	97	70	—
'78-87.....	64 $\frac{1}{2}$	53	49	71	116	—	17	18	21 $\frac{1}{2}$	78	52	—
'67-77.....	63	55	52	74	125	—	23	24	28 $\frac{1}{2}$	87	64	—

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

890	94	82	81	84	80	577	54	54	*	*		
'91	84	76	75	85	85	565	57	54	116	130	123	
'92	84	76	92	92	86	586	58	56	116	119	118	
'93	84	76	96	92	85	592	62	61	120	106	113	
'94	87	76	85	80	78	560	48	48	118	127	123	
									117	117	117	
1895	92	80	71	73	74	544	43	42	113	116	115	
'96	84	71	67	68	78	512	46	44	109	91	100	
'97	87	75	85	80	75	554	39	39	109	64	86	
'98	84	67	87	78	76	542	40	41	106	50	78	
'99	86	75	77	69	82	552	44	43	103	48	75	
1900	94	82	85	81	82	594	46	45	86	63	74	
'01	86	80	94	85	84	596	38	38	80	55	67	
'02	87	80	92	85	82	612	30	30	80	48	64	
'03	92	85	85	81	80	588	36	34	80	47	63	
'04	94	91	75	77	82	584	44	40	86	58	72	

* Index numbers not included in the general average.

Average Prices of Commodities—Contd.

No. of Article	19A*	19C*	19B*	19	16—19	1—19	20A	20B	21	22	—	23
	Tea.				Sugar, and Tea.	Food. Total.	Iron.			Copper.		Tin.
Year.	Common, d. per lb.	Indian Good Medium d. per lb.	Average Import Price. d. and dec. per lb.	Mean of 19A and 19B.	Total.		Scotch Pig. s. and d. per ton	Cleveland (Middlesborough) Pig. s. and d. per ton	Bars, Common. £ per ton	Chili Bars. £ per ton	English Tough Cake. £ per ton	Straits. £ per ton
1890	4½	8½	10'65	—	—	—	49'7	47'7	6½	54	59	94
'91	5½	8½	10'70	—	—	—	47'2	40	5½	51	55	91
'92	4½	7	10'07	—	—	—	41'10	38'6	5½	45	48	93
'93	5½	7½	9'74	—	—	—	42'4	34'10	5	44	47	85
'94	4½	7½	9'59	—	—	—	42'8	35'9	4½	40	43	68
1895	4½	7½	9'63	—	—	—	44'5	36'1	4½	43	46	63
'96	4	7½	9'55	—	—	—	46'10	38'2	5	47	50	60
'97	4	7½	9'36	—	—	—	45'4	40'7	5½	49	52	62
'98	4½	6½	9'13	—	—	—	47'2	42'2	5½	52	55	72
'99	5½	7½	8'82	—	—	—	63'9	60'1	7½	74	78	123
1900	5½	6½	8'58	—	—	—	60'4	69'3	9	73	77	134
'01	4	5½	7'67	—	—	—	53'9	45'5	6½	66	71	118
'02	3½	5½	7'20	—	—	—	54'6	49'3	6½	53	57	121
'03	4½	6½	7'71	—	—	—	52'3	46'3	6½	58	62	127
'04	5	6½	7'21	—	—	—	51'5	43'3	6½	59	63	127
Average...												
1895-1904	4½	6½	8½	—	—	—	53	47	6½	57½	61	101
'88-97...	4½	8	10½	—	—	—	45	38½	5½	50	53	83
'78-87...	6½	—	12½	—	—	—	46	38	5½	55	60	89
'67-77...	11½	—	17½	—	—	—	69	60	8½	75	81	105

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

	*		*									
1890	40	—	62	51	282	1,382	72	—	77	72	—	90
'91	49	—	62	56	285	1,454	68	—	68	68	—	87
'92	43	—	59	51	278	1,387	61	—	66	60	—	89
'93	48	—	57	53	299	1,360	61	—	61	59	—	81
'94	38	—	56	47	260	1,259	62	—	59	53	—	65
1895	37	—	56	47	247	1,224	64	—	59	57	—	60
'96	36	—	56	46	236	1,173	68	—	61	63	—	57
'97	36	—	54	45	209	1,243	66	—	64	65	—	59
'98	40	—	53	46	205	1,285	68	—	67	69	—	69
'99	49	—	51	50	212	1,241	92	—	88	99	—	117
1900	47	—	50	49	214	1,307	100	—	109	97	—	128
'01	36	—	44	40	183	1,277	78	—	79	88	—	112
'02	33	—	42	38	162	1,278	79	—	74	71	—	115
'03	38	—	44	41	174	1,261	76	—	76	77	—	121
'04	44	—	42	43	199	1,286	74	—	74	79	—	121

* Index numbers not included in the general average.

Average Prices of Commodities—Contd.

No. of Article } Year.	24 Lead.	25A Walsend Hetton in London.	25B New- castle Steam.	26 Average Export Price.	20-26 Mine- rals. Total.	27 Mid- ling Ameri- can. d. per lb.	28 Fair Dhollerah. d. per lb.	29A St. Peters- burg. £ per ton	29B Russian, Average Import. £ per ton	30A Manila Fair Roping. £ per ton	30B St. Peters- burg Clean. £ per ton	31 Jute. Good Medium £ per ton
	English Pig. £ per ton	s. per ton	s. per ton	s. and dec. per ton								
1890	13 $\frac{1}{4}$	19	13 $\frac{1}{2}$	12'62	—	6	31 $\frac{5}{16}$	27	26	39	26	13 $\frac{1}{4}$
'91	12 $\frac{1}{2}$	19	11 $\frac{3}{4}$	12'16	—	4 $\frac{11}{16}$	3 $\frac{1}{4}$	28	26	32	24	13
'92	10 $\frac{5}{8}$	18 $\frac{1}{2}$	10	11'04	—	4 $\frac{3}{16}$	3	28	26	28	24	15
'93	9 $\frac{3}{4}$	19 $\frac{1}{2}$	10 $\frac{1}{2}$	9'90	—	4 $\frac{5}{8}$	3 $\frac{9}{16}$	34	31 $\frac{1}{2}$	26	24	13
'94	9 $\frac{5}{8}$	16 $\frac{1}{2}$	10	10'50	—	3 $\frac{3}{16}$	2 $\frac{5}{8}$	32	33	22	24	12 $\frac{1}{2}$
1895	10 $\frac{3}{8}$	15	8 $\frac{1}{2}$	9'33	—	3 $\frac{7}{16}$	2 $\frac{3}{4}$	26	28	19	25	11
'96	11 $\frac{1}{2}$	15	8	8'85	—	4 $\frac{11}{16}$	3 $\frac{3}{16}$	26	27	17 $\frac{1}{2}$	25	12 $\frac{1}{4}$
'97	12 $\frac{3}{8}$	15 $\frac{3}{4}$	8 $\frac{1}{4}$	8'98	—	3 $\frac{9}{16}$	3 $\frac{1}{16}$	24 $\frac{1}{2}$	27	16	25	11
'98	13 $\frac{1}{4}$	16 $\frac{3}{4}$	10 $\frac{3}{4}$	9'92	—	3 $\frac{5}{16}$	2 $\frac{1}{2}$	24	25 $\frac{1}{2}$	27	25	11
'99	15 $\frac{3}{8}$	18 $\frac{1}{2}$	12	10'72	—	3 $\frac{1}{16}$	2 $\frac{3}{4}$	23	24 $\frac{1}{2}$	41	27	12 $\frac{1}{2}$
1900	17 $\frac{1}{4}$	23 $\frac{1}{2}$	17 $\frac{1}{2}$	16'75	—	5 $\frac{1}{16}$	4 $\frac{3}{16}$	35	30	39	28	14 $\frac{1}{4}$
'01	12 $\frac{3}{8}$	20	12 $\frac{1}{2}$	13'86	—	4 $\frac{1}{16}$	3 $\frac{1}{16}$	38	39 $\frac{1}{2}$	37	27	12 $\frac{1}{2}$
'02	11 $\frac{3}{8}$	18 $\frac{1}{2}$	11 $\frac{1}{4}$	12'29	—	4 $\frac{7}{16}$	3 $\frac{11}{16}$	32	37	43	27	12 $\frac{1}{4}$
'03	11 $\frac{3}{4}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	11'70	—	6'03	4 $\frac{1}{8}$	32	36	36	27	13 $\frac{1}{2}$
'04	12 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{2}$	11'13	—	6'60	5	36	38 $\frac{1}{2}$	38	28	14
Average....												
1895-1904	12 $\frac{7}{8}$	17 $\frac{3}{8}$	10 $\frac{1}{2}$	11 $\frac{3}{8}$	—	4 $\frac{11}{16}$	3 $\frac{7}{16}$	29 $\frac{1}{2}$	31 $\frac{1}{2}$	31 $\frac{1}{2}$	26 $\frac{1}{2}$	12 $\frac{1}{2}$
'88-97....	12	17 $\frac{1}{4}$	9 $\frac{7}{8}$	10 $\frac{1}{4}$	—	4 $\frac{11}{16}$	3 $\frac{5}{16}$	28	28	28 $\frac{1}{2}$	25	13
'78-87....	14	16 $\frac{3}{4}$	8 $\frac{1}{2}$	9	—	6	4 $\frac{1}{4}$	33	34	35 $\frac{1}{2}$	26 $\frac{1}{2}$	15
'67-77....	20 $\frac{1}{2}$	22	12 $\frac{1}{2}$	12 $\frac{1}{2}$	—	9	6 $\frac{3}{4}$	46	48	43	35	19

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1890	65	86	—	101	563	67	58	56	82	70		
'91	61	86	—	97	535	52	48	57	72	68		
'92	52	84	—	88	500	46	45	57	67	79		
'93	48	89	—	80	479	51	53	70	64	68		
'94	47	75	—	84	445	42	39	69	59	66		
1895	52	68	—	75	435	43	41	57	56	58		
'96	56	68	—	71	444	48	46	56	55	64		
'97	62	72	—	72	460	43	45	55	53	58		
'98	65	76	—	79	493	37	37	52	67	58		
'99	75	84	—	86	641	40	41	51	87	66		
1900	84	107	—	134	759	61	62	69	86	75		
'01	62	91	—	111	621	53	51	82	82	67		
'02	55	84	—	98	576	54	55	74	90	64		
'03	57	75	—	94	576	67	61	72	81	71		
'04	60	74	—	89	571	73	74	79	85	74		

Average Prices of Commodities—Contd.

No. of Article	32A	32B	33	34	27-34	35A	35B	35C	36A	36B	37A	37B
	Wool.			Silk.		Hides.			Leather.		Tallow.	
Year.	Merino, Port Phillip, Average Fleece.	Merino, Adelaide, Average Grease.	English, Lincoln Half Hogs.	Tsatlee.	Textiles, Total.	River Plate, Dry.	River Plate, Salted.	Average Imports.	Crop Hides.	Average Import.	St. Petersburg, Y.C.	Town.
	d. per lb.	d. per lb.	d. per lb.	s. per lb.		d. per lb.	d. per lb.	d. and dec. per lb.	d. per lb.	d. per lb.	s. per cwt.	s. per cwt.
1890	16	7½	11	14	—	5½	5½	5.19	13	15½	38	26
'91	14½	6¾	9¾	13	—	5½	5½	5.19	13	14½	40	27½
'92	13	6	8¾	12½	—	5½	4½	4.91	13	14½	45	27
'93	12½	6	10¼	12½	—	5½	4½	4.94	13	13½	48	30½
'94	11½	5¾	10¼	10	—	5½	4½	4.65	12½	13½	48	25½
1895	12	5¾	12	10	—	7½	6¼	4.76	13½	13½	48	23
'96	13	6¾	11½	10½	—	6½	5½	4.89	13½	13½	48	21
'97	12½	6	9¾	10½	—	6½	5½	4.93	13½	12½	40	20
'98	13½	6¾	8¾	10½	—	7	6½	5.04	13½	13½	40	22
'99	17½	8½	8¼	13	—	7½	6¼	4.94	13½	13½	—	25
1900	15½	7¾	7¾	13	—	8½	6¼	5.31	14	13½	—	27½
'01	13	6¾	6¾	10½	—	7½	6	5.34	14	13½	—	28
'02	15	7¾	6¼	11	—	7½	6¾	5.52	14	14½	—	32½
'03	16	8¼	7¼	13½	—	8	6½	5.75	14	15½	—	29½
'04	16	8	10¼	12½	—	8¼	6¾	5.66	14	15	—	26½
Average												
1895-1904	14½	7½	8¼	11½	—	7½	6¾	5½	13½	13½	42	25½
'88-97	14	6½	10½	12	—	6½	5¼	5	13½	14½	43	25½
'78-87	18½	8¾	11¼	15	—	8½	6¾	6½	15	17	41	35½
'67-77	21¼	9¾	19½	23	—	9	7	6½	16	18½	45	45

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

	76	56	61	526	70	—	81	—	71
1890	76	56	61	526	70	—	81	—	71
'91	70	49	57	473	66	—	81	—	75
'92	61	44	53	452	63	—	81	—	80
'93	60	52	54	472	65	—	81	—	87
'94	55	51	43	424	64	—	78	—	82
1895	57	61	43	416	84	—	84	—	79
'96	62	58	46	435	77	—	84	—	77
'97	59	49	45	407	75	—	84	—	67
'98	64	44	46	405	82	—	84	—	69
'99	83	42	57	467	85	—	84	—	56
1900	76	40	57	526	90	—	87	—	61
'01	62	35	46	478	84	—	87	—	62
'02	72	32	48	489	87	—	87	—	72
'03	78	37	59	526	91	—	87	—	65
'04	77	51	54	567	94	—	87	—	59

Average Prices of Commodities—Contd.

No. of Article	38	39	40A	40B	41	42	43	44	45A	45B	35-45	20-45	1-45
	Oil.		Seeds		Petro- leum.*	Soda.	Nitrate of Soda.	Indigo.	Timber.		Sundry Mate- rials. Total.	Mate- rials. Total.	Grand Total.
Year.	Palm	Olive.	Lin- seed.	Lin- seed.	Refined.	Crystals.		Bengal, Good Consuming.	Hewn, Average Import.	Sawn or Split, Average Import.			
	£ per ton.	£ per ton.	£ per ton.	s. per qr.	d. per gall.	s. per ton.	s. per cwt.	s. per lb.	s. per load.	s. per load.			
1890	27	41	23	43	5½	61	8½	4½	44	46	—	—	—
'91	26	43	21	42	5½	64	8½	4½	40	43	—	—	—
'92	24	36	18½	39	5	66	8½	4½	40	44	—	—	—
'93	28	36	20½	42	4	58	9¼	5½	38	43	—	—	—
'94	24½	35	20¼	38	3¾	42	9¼	5	36	44	—	—	—
1895	23	36	20¼	37	6	39	8½	4½	37	42	—	—	—
'96	22	30	17½	33	5½	42	8	4½	40	44	—	—	—
'97	22	31	16	33	4½	51	7¾	4	41	47	—	—	—
'98	23	32	16¾	36	5½	54	7¾	3½	42	47	—	—	—
'99	25	33	20	40	6¼	56	7¾	3½	40	49	—	—	—
1900	27½	36	30½	54	6¾	62	8	3½	41	56	—	—	—
'01	26	38	30	53	6½	65	9	3½	39	52	—	—	—
'02	27½	34	28	50	6¼	64	9¾	3¼	39	51	—	—	—
'03	28	33	21	39	6¼	64	9¾	3¼	39	54	—	—	—
'04	27½	32	16	33	6¼	61	10½	2¾	36	51	—	—	—
Average													
1895-1904	25¼	33½	21½	41	5½	56	8½	3½	39½	49½	—	—	—
'88-97....	24½	36	19½	39	5¼	52	8½	4½	40½	44½	—	—	—
'78-87....	32½	40	23	46	6¾	62	12½	6	47	47	—	—	—
'67-77....	39	50	30	60	12½*	92	14	7¼	60	54	—	—	—

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

	69	82	73	45	66	61	59	79	756	1,845	3,227
1890	69	82	73	45	66	61	59	79	756	1,845	3,227
'91	67	86	70	45	70	63	66	73	762	1,770	3,224
'92	61	72	64	40	72	63	62	74	732	1,684	3,071
'93	72	72	69	32	62	66	76	71	753	1,704	3,064
'94	63	70	65	31	46	66	69	70	704	1,573	2,832
1895	59	72	64	48	42	59	59	69	719	1,570	2,794
'96	56	60	56	44	46	57	59	74	690	1,569	2,742
'97	56	62	53	38	56	55	55	77	678	1,545	2,788
'98	59	64	59	41	59	55	48	78	698	1,596	2,881
'99	61	66	67	50	61	55	48	78	714	1,822	3,063
1900	71	72	94	54	67	57	48	85	736	2,071	3,378
'01	67	76	92	52	71	64	47	80	732	1,881	3,158
'02	71	68	87	50	70	70	45	79	786	1,851	3,129
'03	72	66	67	50	70	70	45	82	765	1,867	3,128
'04	71	64	54	49	70	73	40	76	737	1,875	3,161

* Petroleum as compared with the average from 1873-77 only.

V.—*Commercial History and Review of 1904.*

THE following is taken from the Supplement to the *Economist* of 18th February, 1905, in continuation of similar extracts for previous years:—

“THROUGHOUT the greater part of 1904 the country continued to labour under the industrial and financial depression which had weighed upon it ever since the South African war. In its closing months, however, signs of improvement manifested themselves, and inspired the hope that a cycle of more prosperous years had been entered upon. Thus far, it must be admitted, the recovery has not been either so general or so pronounced as to justify any confident predictions of better times in store. Still, some progress has been made, and the detailed reports we publish in the latter part of this review testify that in nearly all markets the former feeling of despondency has given place to a sanguine belief that at length the corner has been turned. And such a change of sentiment, in itself, by encouraging enterprise, goes far to bring about the realisation of the better conditions anticipated. Throughout the past year the war in the Far East was a great drag upon business. Of course, it acted as a stimulus to certain branches of industry, such, for instance, as the coal and woollen trades, that found occupation in catering for the needs of the belligerents, but it sadly interfered with general commerce, and the disquieting incidents to which from time to time it gave rise kept markets in a constant ferment of anxiety with regard to possible further international complications, with a consequent unsettlement and restriction of trade. Another unsettling influence, which is so much in men’s minds that there is no need to enlarge upon it, was the continuance of the fiscal agitation set on foot by Mr. Chamberlain, since whatever opinions may be entertained as to the merits of the protectionist campaign, there is no gainsaying the fact that uncertainty as to the future fiscal régime increases the hazards of trade, and so tends to check business. It is evident, moreover, that the heavy taxation we have been called upon to bear has impaired the purchasing power of the community, especially as rates have mounted up as well as taxes, and the enforced restriction of the demand for commodities has, in its turn, curtailed the demand for labour, with the result that a larger proportion than usual of our working population have been thrown out of employment, while numbers of those for whom work has been found have had to submit to reductions of wages. As against these depressing influences the last quarter of the year benefited through the resumption of full activity by the cotton industry, which up till then had been compelled to work short time, because of the scarcity and dearth of the raw material. Cheaper money, too, exercised a stimulating influence, and the investment markets having partially recovered from the heavy drain to which they were subjected by the war borrowings of the Government, capital became somewhat less difficult to obtain for industrial undertakings.

“Last year’s experience, like that of 1903, has falsified the assertion of the tariff agitators that our foreign trade is dwindling, and may be lost altogether unless we have recourse to a system of protection. So far from diminishing, our oversea trade in 1904 underwent a further expansion, and attained larger dimensions than ever before. Indeed, throughout the year the growth in our foreign trade was the mainstay of our industries, since it helped to make good a dwindling of our home trade. The values of our imports and exports for the year, as compared with those for 1903, are shown in the following statement :—

	1904.	1903.	Increase or Decrease.	
			Amount.	Per Cent.
	£	£	£	
Imports.....	551,362,000	542,600,000	+ 8,762,000	1·6
Exports of home products (including new ships).....	300,818,000	290,800,000	+ 10,018,000	3·4
Re-exports of foreign and colonial merchandise	70,322 000	69,574,000	+ 748,000	1·1
Total trade	922,502,000	902,974,000	+ 19,528,000	2·1

It is our export trade that the Chamberlainites declare to be dying, and any growth in our imports they would have us look upon as an evil, since it means, they maintain, that foreign goods are ousting the products of our home industries. But neither of these contentions receives any support from the statistics of last year. Of the total increase of 8,762,000*l.* in our imports, no less than 8,700,000*l.* was under the head of ‘raw materials and articles mainly unmanufactured,’ while of the much larger increase of 10,018,000*l.* in our exports, 9,155,000*l.* is accounted for under the head of ‘articles wholly or mainly manufactured.’ Another thing we are asked by the tariff reformers to believe is that our foreign trade would show a material decline if it were not that a falling off in our exports to foreign countries is offset by an expansion of our exports to our colonies and possessions. That, however, was certainly not the case in 1904, for whereas in that year foreign countries bought 9,159,000*l.* worth more of our products than they did in 1903, the value of our exports to our colonies and possessions increased by less than 900,000*l.* It is worth noting, too, that when the tariff agitators speak of our colonial trade, it is the trade with our self-governing colonies to which they attach the chief importance, India and our other possessions being practically ignored by them. But last year, while our exports to Canada, Australasia, and South Africa fell off, as compared with 1903, by 7,177,000*l.*, those to India increased by 6,044,000*l.* Of course, it would be absurd to attempt to draw general conclusions from the figures of one or two years only, and unquestionably the self-governing colonies constitute markets for our products which we should strive to cultivate in every legitimate way. Nevertheless,

the fact remains that the statistics of our foreign trade since the tariff agitation was initiated controvert all the assertions in regard to that trade upon which the demand for a change in our fiscal system was based. So completely are they controverted by the figures for last year that an attempt has been made to explain these away on the ground that it is the volume of our trade which is the main consideration, and that the increase in the value of our foreign commerce last year was entirely due to higher prices. And it is true that part of the recorded increase in the value of both our imports and our exports was due to a higher level of average prices. Much the larger part, however, was ascribable to the greater volume of our trade. In Appendix A is given a calculation which shows to what extent each of the two factors, quantities and prices, contributed to the increase in aggregate value, and on reference to that it will be seen that out of a total increase, as compared with 1903, of 8,014,000*l.* in the recorded value of the imports retained for home consumption, 7,103,000*l.* was due to an increase in quantities, and 911,000*l.* to higher prices; and similarly of a recorded increase of 10,018,000*l.* in our exports, fully 8,100,000*l.* was due to larger quantities, and a little over 1,900,000*l.* to higher prices. With the changes in prices we shall deal later on. As to quantities, we show in the following statement how the growth in 1904 compares with the movement in immediately preceding years:—

Volume of our Foreign Trade. Increase or Decrease per Cent. as compared with previous Years.

	Imports Retained for Home Consumption.	Exports of Home Produce.	Imports and Exports.
	Per cent.	Per cent.	Per cent.
1904.....	+ 1.50	+ 2.80	+ 2.0
03.....	+ 1.94	+ 1.41	+ 1.74
02.....	+ 2.60	+ 6.84	+ 4.22
01.....	+ 2.45	+ 1.46	+ 2.06
00.....	+ 1.34	— 3.75	— 0.62
1899.....	+ 0.72	+ 2.68	+ 1.43
98.....	+ 4.59	— 0.14	+ 2.82

“ The increase in the value of our exports that took place in the last three months of 1904, was considerably greater than that recorded for the whole of the previous nine months, a result to which the resumption of full work by the cotton industry largely contributed.

“ It has already been said that greater activity in our foreign trade in 1904 was accompanied by a restriction of our home trade. Evidence of this is afforded by the returns of the traffic on our railways. That would necessarily be swollen to some extent by the conveyance of the larger volume of our imports and exports, but, nevertheless, as will be seen from the following statement, the aggregate receipts were smaller than in 1903, from which it is to be inferred that the home trade yielded a smaller volume of traffic:—

	Passengers and Parcels.		Merchandise.		Minerals.	
	1904.	1903.	1904.	1903.	1904.	1903.
	£	£	£	£	£	£
First six months ..	17,159,600	17,021,800	11,934,700	11,914,100	8,670,600	8,841,400
Second „ ..	20,442,200	20,318,200	12,104,700	12,227,200	8,888,000	8,987,800
Total for year ...	37,601,800	37,340,000	24,039,400	24,141,300	17,558,600	17,829,200
Increase or decrease first six months ..	+ 137,800	= 0·8 %	+ 20,600	= 0·2 %	+ 189,200	= 2·2 %
Increase or decrease second six months ..	+ 124,000	= 0·6 %	- 122,500	= 1·0 %	- 99,800	= 1·1 %
Total increase or decrease for year	+ 261,800	= 0·7 %	- 101,900	= 0·4 %	+ 89,400	= 0·5 %

“ Similarly the records of the Bankers’ Clearing House fail to show that expansion which might have been expected to result from concurrent activity in the home and foreign trade. The figures are :—

Bankers’ Clearings.

[000’s omitted.]

	1904.	1903.	Increase or Decrease	
	£	£	£	Per cent.
Town clearings ..	9,677,988,	9,234,956,	+ 443,032,	4·80
County clearings ..	886,209,	884,869,	+ 1,340,	0·15
Total	10,564,197,	10,119,825,	+ 444,372,	4·39
Special days—				
Stock Exchange pay- days	1,536,586,	1,456,775,	+ 79,811,	5·48
Consols settling days...	597,160,	593,605,	+ 3,555,	0·59
Fourths of the month	445,281,	382,285,	+ 62,996,	16·47

Country Clearings.

	1904.	1903.	Increase or Decrease.	
	£	£	£	Per cent.
Country cheques cleared in London	886,209,000	884,869,000	+ 1,340,000	0·15
Manchester	218,544,000	238,574,000	+ 9,970,000	4·18
Liverpool	198,319,000	173,668,000	+ 24,651,000	14·14
Birmingham	53,200,000	55,390,000	- 2,190,000	3·95
Newcastle-on-Tyne	78,167,000	77,174,000	+ 993,000	1·28
Bristol	30,452,000	31,572,000	- 1,120,000	3·51
	1,495,191,000	1,461,547,000	+ 33,644,000	2·30

“The London clearings are so much affected by financial transactions, that they are not so trustworthy a guide to the condition of trade as are the country clearings, and if we except Liverpool and Manchester, which were probably influenced in an exceptional way by the aberrations of the cotton market, we find that the aggregate of the clearings at the other provincial centres last year was smaller than in 1903. But the most conclusive evidence of slackness in the home trade is afforded by the labour statistics, with which we shall deal presently, and which show that, although in 1904 we were doing a bigger foreign business than in 1903, yet a larger proportion of our working classes were unemployed or only partially employed.

“Reverting to the rise in the prices of commodities, which, as has already been pointed out, helped to swell the increase in the recorded value of our foreign trade last year, we show in the following statement how the average prices of our imports and exports in 1904 compare with those of 1903 and previous years. The details of the calculation will be found in Appendix A:—

Prices of Imports and Exports. Average Rise or Fall as compared with previous Years.

	Imports Retained for Home Consumption.	Exports of Home Produce.	Imports and Exports.
	Per cent.	Per cent.	Per cent.
1904.....	+ 0·19	+ 0·62	+ 0·36
'03.....	+ 0·37	+ 1·20	+ 0·69
'02.....	— 0·62	— 5·23	— 2·42
'01.....	— 3·69	— 5·14	— 4·25
'00.....	+ 8·20	+ 14·48	+ 10·55
1899.....	+ 1·78	+ 6·62	+ 3·56
'98.....	+ 0·24	— 0·26	— 0·07

“Because of the average rise in the prices of our imports, they cost us last year 911,000*l.* more than they would have done had we been able to buy them at the average prices of 1903, but, on the other hand, we obtained for our exports 1,869,000*l.* more than we should have received if we had sold them at the prices of 1903. On balance, therefore, so far as regards our foreign trade, we gained more from the rise in prices than we lost. We have been speaking thus far of average prices, but it is desirable to show also how prices stood at the end of the year as compared with the beginning. This, as indicated by our Index Number, is done in the following statement, which also gives the record at half-yearly periods for a number of previous years:—

‘Index Number,’ representing the Combined Prices of Twenty-two Leading Commodities.		‘Index Number,’ representing the Combined Prices of Twenty-two Leading Commodities.	
1st January, 1905.....	2136	1st January, 1901.....	2126
„ July, '04.....	2130	„ July, '00.....	2211
„ January, '01.....	2197	„ January, '01.....	2145
„ July, '03.....	2111	„ July, 1899.....	2028
„ January, '03.....	2003	„ January, '99.....	1918
„ July, '02.....	1995	„ July, '98.....	1915
„ January, '02.....	1948	„ January, '98.....	1890
„ July, '01.....	2007		

“The Index Number, it will be seen, was somewhat lower at the end of the year than at the beginning, but that was due to the great fall in the price of cotton, which more than offset a rise in a number of other commodities. And the decline in the Index Number during the twelve months does not conflict with the fact that the average of prices was higher in 1904 than in 1903, because the range as indicated by the Index Number, which in 1903 was between a minimum of 2003 and a maximum of 2197, was in 1904 between a minimum of 2118 and a maximum of 2234, the latter figure being recorded at the end of March, when the prices of cotton and cotton manufactures had been greatly advanced.

“British agriculturists in 1904 certainly enjoyed better conditions than in 1903, but that is not saying much, since to them 1903 was little less than disastrous. And some of its unfavourable conditions were projected into 1904, the waterlogged state of the soil preventing or seriously checking seeding operations until quite late in the spring. That resulted in a considerable reduction of the area under wheat, the principal cereal being largely replaced by oats. The yield of wheat per acre was poor, but the crop was reaped in good condition, and has realised higher prices than for several years past. Barley and oats also gave an indifferent yield, and in regard to the principal cereals, it may be concluded that while the yield per acre was less than in 1903, the crops probably paid better, from the better condition in which they were secured, and the higher prices realised for the produce. Moreover, a good crop of hay was secured, and potatoes and other root crops yielded well. There were thus ample supplies of fodder, and as the good prices obtained for sheep and cattle in previous years were at least maintained, the pastoral branch of the industry was once more the most profitable to the agriculturist. On the whole, then, agriculture in 1904, while it had, as always, to contend with many difficulties, enjoyed some compensating advantages, and may be regarded as having given about average results. And the prospects for the coming year are encouraging. Conditions for working on the land have been favourable, and there has been a considerable increase in the area planted with wheat, for which it is anticipated that good prices will continue to prevail.

Gazette Average Price of Wheat (per Imperial Quarter) in United Kingdom immediately after Harvest, and Total Average Gazette Price of Calendar Years.

Periods.	1904.		1903.		1902.		1901.		1900.		1899.		1898.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
After harvest.....	30	2	30	3	31	7	27	-	28	8	25	-	28	1
Calendar year average	28	4	26	9	28	1	26	9	26	11	25	8	34	-

Comparative Gazette Prices of Grain.

Week.	Wheat.						Barley.			Oats.		
	1904.		1903.		1902.		1904.		1903.		1902.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
July 30.....	28	-	28	7	31	5	19	9	20	10	25	-
Aug. 6.....	28	3	28	11	31	8	19	9	21	-	17	10
13.....	28	4	29	3	31	7	19	9	20	1	24	11
20.....	28	8	29	11	31	7	22	5	21	3	24	9
27.....	29	5	29	9	31	5	23	2	20	4	22	10
Sept. 3.....	30	2	30	-	31	7	25	3	22	3	26	2
10.....	30	-	30	3	29	9	24	10	22	5	24	6
17.....	29	7	28	6	27	10	24	9	22	4	27	5
24.....	29	10	27	5	27	1	25	10	24	2	26	1
Oct. 1.....	29	10	27	-	26	6	25	5	24	-	15	9
8.....	30	2	26	3	25	10	25	6	23	9	15	8
15.....	30	5	25	10	25	5	25	4	23	8	15	8
22.....	30	4	25	8	25	1	25	5	23	9	15	11
29.....	30	6	25	10	24	11	24	11	23	7	15	11
Nov. 5.....	30	6	25	-	25	-	24	2	26	7	15	10
12.....	30	3	26	4	25	1	24	6	24	3	15	11
19.....	30	2	26	6	25	-	24	5	24	6	15	11
26.....	30	5	26	9	24	11	24	4	24	3	16	1
Dec. 3.....	30	4	26	6	25	-	24	6	23	11	16	2
10.....	30	4	26	8	25	1	24	4	23	9	16	2
17.....	30	4	26	7	25	-	24	4	23	2	16	2
24.....	30	3	25	9	24	10	24	7	23	-	16	1
31.....	30	4	26	5	24	10	24	8	22	5	16	2

"The returns issued by the Labour Department of the Board of Trade show that throughout the whole of 1904 there was a larger proportion of skilled labourers lacking employment than in 1903. The percentage of unemployed relieved by trade unions was higher for every month as compared with 1903, and the mean for the year works out at 6·5 per cent., as compared with 5·1 per cent. in 1903, 4·4 per cent. in 1902, 3·8 per cent. in 1901, 2·9 per cent. in 1900, and an average for the ten years 1894 to 1903 of 4·1 per cent. Our working classes, too, suffered not only from slackness of employment, but also from reductions in wages, though the amount of these was comparatively moderate. As to the movement in wages, the Board of Trade reports that 'the downward tendency in wages which began in 1901 continued throughout 1904, the amount of the

fall, measured in weekly loss of wages, being about the same as in 1903, but less than two-thirds of the amount in 1902 or 1901. These four years followed a period of rising wages, and the amount lost since the beginning of 1901 is much less than the amount gained during the preceding years of rising wages, and is not much in excess of the abnormal amount of increase obtained in 1900. This will be seen from the following table, in which the net amount of increase or decrease in weekly wages is shown for each of the last ten years, together with the number of workpeople affected. It will be seen that during the ten years the gain in wages exceeded the loss by £77,615*l.* per week. The figures are exclusive of changes affecting agricultural labourers, seamen, fishermen, railway servants, police, and Government *employees*, and the amounts stated are those computed to be due to changes in rates of wages as distinct from changes in earnings caused by fluctuations of employment':—

Year.	Number of Workpeople Affected by Changes in Rates of Wages.	Computed Amount of Change in Weekly Wages Compared with Previous Year.	
		Net Increase.	Net Decrease.
		£	£
1904	795,587	—	39,117
'03	892,922	—	38,557
'02	886,341	—	72,971
'01	910,399	—	78,653
'00	1,113,431	207,555	—
1899	1,168,985	90,407	—
'98	1,013,107	80,674	—
'97	582,333	30,494	—
'96	601,115	26,225	—
'95	433,652	—	28,437
Total for ten years } 1895-1904	—	435,355	257,740

"Fortunately, however, the Board is able to report that 'the year 1904 was singularly free from trade disputes causing a stoppage of work. The numbers of disputes, of workpeople affected, and of working days lost, were all the smallest figures on record. The number of workpeople involved was less than one in every hundred of the industrial population: and even this small percentage would be still further reduced if agricultural labourers and seamen were included, as very few strikes or lock-outs occur among these workpeople. Spread over the same industrial population the actual time lost owing to trade disputes was very inconsiderable, being less than one-seventh part of a working day in the year.

"The comparative freedom from disputes in 1904 is brought out in the following summary table':—

Year.	Number of Disputes Beginning in each Year.	Number of Workpeople Affected by Disputes Beginning in each Year.			Aggregate Duration in Working Days of all Disputes in each Year.
		Directly.	Indirectly.	Total.	
1904	334	53,801	30,121	83,922	1,416,265
'03	387	93,515	23,386	116,901	2,338,668
'02	442	116,824	139,843	256,667	3,479,255
'01	642	111,437	68,109	179,546	4,142,287
'00	648	135,145	53,393	188,538	3,152,694
1899	719	138,058	42,159	180,217	2,516,416
'98	711	200,769	53,138	253,907	15,289,478
'97	864	167,453	62,814	230,267	10,345,523
'96	926	147,950	50,240	198,190	3,746,368
'95	745	207,239	55,884	263,123	5,721,670
'94	929	257,314	67,934	325,248	9,529,010
'93	615	594,149	40,152	634,301	30,467,765

"On the whole, then, it may be said that, as regards the conditions of labour, our working population fared worse in 1904 than in previous years, though probably not so very much worse as the great commotion that has been raised on the question of the unemployed might lead people to think. But, anyhow, whatever trials they were subjected to on that account were aggravated by an increase in the cost of living. The wholesale prices of most vegetable and animal foodstuffs averaged higher for the year than in 1903, and there was a very distinct rise in tea, tobacco, and sugar, commodities which enter largely into the consumption of workmen and their households. The rise in tea and tobacco is, of course, ascribable to the additional duties imposed in the last Budget, but as to the cause of the rise in sugar there is a conflict of opinion. By many the Sugar Convention is held responsible for it, while the supporters of that international agreement strenuously maintain that it is attributable to changes in supply and demand. Changes in prices are, as a rule, due to so many different causes, that it is seldom possible to single out any one as the really determining influence. But even on the theory that the rise in sugar is the result of alterations in supply and demand, it is obvious that these are in a great measure due to the Convention, since by abolishing the bounties on production it discouraged the cultivation of sugar beets, and by reducing the internal taxes in the bounty-giving countries, it has greatly enlarged the consumption of sugar by the continent of Europe. It has made sugar dearer here, and cheaper elsewhere. And although it did not affect last year specially, the imposition of a duty on sugar has permanently raised its costs to the consumers. Indeed, the growth of taxation, which has been so enormous of late years, has weighed very heavily upon the whole community, and by compelling them to limit their expenditure in other directions, has contributed materially to the slackness of our home trade, thus inflicting a double injury upon our working population.

"The more hopeful feeling that sprang up towards the end of 1904 still prevails, and it has been stimulated by the further expansion of

our foreign trade shown by the Board of Trade returns for January. Another satisfactory feature is the increase in the revenue from stamps, for although that embraces both financial and mercantile transactions, and is thus only an imperfect indication of trade conditions, yet it does respond to any access of commercial activity. This branch of the revenue, which had been declining in the first six months of the current financial year, and remained stationary during the December quarter, shows for the period from 1st January to 11th February an increase of 290,000*l.* Encouragement, too, is to be derived from the fact that in their monthly report the Labour Department of the Board of Trade were able to state that in the month of January 'employment in most trades showed some improvement as compared with a year ago.' Then the fact that the war in the Far East has reached its present stage without bringing about other international complications, strengthens the hope that any such untoward eventuality may be avoided, and the impression that because of Russia's internal embarrassments peace between the two belligerents may be arranged continues to grow. It may be that too much is being made of this latter optimistic feeling, but it is having a decided effect at the moment. Some of our customers, moreover, are getting into better case. In South Africa the condition of things is mending, though slowly, and in Australia further progress is being made towards complete recovery from the effects of the prolonged drought. At home the investor still displays a disposition to participate in good industrial enterprises, and the prospect of cheap money is another favourable factor in the situation. It is also to be hoped that in 1905 we shall not see another such cataclysm in an important department of industry as that which overtook the cotton trade last year. On the other hand, a general election would upset business, and a continuance of the war between Russia and Japan would further disorganise many branches of commerce. The unsettlement in the Near East also continues to give rise to anxiety. Still, on the whole, the outlook for 1905, though not unclouded, is fairly hopeful.

"The course of the London money market in 1904 was uneventful, but provided distinct indications of a further relaxation of the monetary strain produced by the Boer war. No doubt the comparative ease that prevailed had other contributory causes, one of which was the considerable increase in the output of gold from the Transvaal mines, though that might also be termed one of the phases of the recovery from the effects of the war. The position became so strong, that it was possible to reduce the Bank rate from 4 to 3 per cent. much earlier in the year than in 1903, and a remarkable testimony to the increased supply of funds was the fact that the 3 per cent. rate sufficed for the whole period from the middle of April to the end of the year. There was a time when an advance seemed very probable, gold flowing out of the country in large amounts throughout the months of October and November, where there were occasional spasms of political anxiety on account of the strained relations between this country and Russia arising out of the Dogger Bank incident. The market, though less

dependent on the Bank than in the two preceding years, was, except for a comparatively short period during the summer, working on a small margin, which was found to speedily run off on the occurrence of any special demand, such as the floating of a large loan, or the temporary withdrawal of funds for the repayment or replacement of Treasury Bills, or other Government financial operations. Still, it was clear that more money was available, and, the lower rates proving less attractive, the foreign funds that had been employed here were to a large extent withdrawn, a circumstance that could not be regretted, since, though the market had during a time of pressure been relieved by the possession of these credits, their existence was a source of anxiety from the knowledge that they might possibly be called for at some awkward juncture.

"Our market was the better able to part with the continental money, which was required at home mainly for the purpose of providing for Russian borrowing, from the fact that no demand came from the United States, which, indeed, helped to meet the continental requirements by shipping large sums in gold from New York to Europe. The average Bank rate for the year was 3*l.* 5*s.* 10*d.* per cent., as compared with 3*l.* 15*s.* per cent. in 1903, and the market rate for best three months' bills worked out at an average of 2*l.* 13*s.* 8*d.* per cent. for the twelve months, as compared with 3*l.* 7*s.* 8*d.* per cent. in the previous year. Although the deposit rates were also lower, there was a smaller margin of profit on banking operations, and though, fortunately for themselves, the banks had not, as at the end of 1903, to provide large sums for writing down the value of securities, they found it necessary in many cases to pay lower dividends to their shareholders. Most of these reductions took effect in the distributions made at the end of the year. Subjoined are tables of the London and continental rates of discount :—

	1904.	1903.	1902.	1901.	1900.
Changes in bank rate	two per cent	three per cent.	three per cent.	six per cent.	six per cent.
Highest bank rate	4	4	4	5	6
Lowest ,, 	3	3	3	3	3
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Average bank rate	3 5 10	3 15 -	3 6 7	3 14 5	3 19 2
Average market rate for best three months' bills }	2 13 8	3 7 8	2 19 3	3 3 3	3 13 3
Market below bank	- 12 2	- 7 4	- 7 4	- 11 2	- 5 11

	1899.	1898.	1897.	1896.	1895.
Changes in bank rate	six per cent.	four per cent.	six per cent.	three per cent.	none per cent.
Highest bank rate	6	4	4	4	2
Lowest „	3	2½	2	2	2
Average bank rate	£ s. d. 3 13 6	£ s. d. 3 4 9	£ s. d. 2 12 6	£ s. d. 2 10 5	£ s. d. 2 - -
Average market rate for best } three months' bills	3 5 -	2 11 10	1 15 10	1 7 7	- 15 11
Market below bank	- 8 6	- 12 11	- 16 8	1 2 10	1 4 1

European Rates of Discount per Cent. per Annum, 1904.

Cities.	Beginning of Months of 1904.												
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
<i>London.</i>	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.	P. et.
Bank rate	4	4	4	4	3	3	3	3	3	3	3	3	3'33
Open market	3 ⁵ / ₁₆	2 ⁸ / ₈	3 ¹ / ₁₆	2 ¹³ / ₁₆	2 ¹³ / ₁₆	2	1 ¹⁵ / ₁₆	3	2 ³ / ₄	2 ¹ / ₄	3	2 ¹⁵ / ₁₆	2'74
<i>Paris.</i>													
Bank rate	3	3	3	3	3	3	3	3	3	3	3	3	3
Open market	2 ⁷ / ₈	2 ⁵ / ₈	2 ⁵ / ₈	2 ³ / ₄	2½	2½	1 ⁹ / ₁₆	1½	1½	1 ³ / ₈	2 ⁹ / ₁₆	2 ³ / ₈	2'17
<i>Vienna.</i>													
Bank rate	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3'5
Open market	3 ³ / ₈	2 ³ / ₈	3	3 ¹ / ₈	2 ³ / ₄	3	3¼	2 ⁷ / ₈	3 ³ / ₈	3½	3 ³ / ₈	3 ³ / ₈	2'94
<i>Berlin.</i>													
Bank rate ...	4	4	4	4	4	4	4	4	4	4	5	5	4'17
Open market	3 ¹ / ₈	2½	3½	3¼	3	2 ⁵ / ₈	3 ¹ / ₈	2 ⁵ / ₈	2 ⁵ / ₈	3 ¹ / ₈	4½	3 ³ / ₈	2'9
<i>Frankfort.</i>													
Bank rate	4	4	4	4	4	4	4	4	4	4	5	5	4'17
Open market	3 ¹ / ₈	2½	3½	3¼	3	2 ⁵ / ₈	3 ¹ / ₈	2 ⁵ / ₈	2 ⁵ / ₈	3 ¹ / ₈	4½	3 ³ / ₈	2'9
<i>Amsterdam.</i>													
Bank rate ..	3½	3½	3½	3½	3½	3½	3½	3	3	3	3	3	3'29
Open market	3 ³ / ₈	3¼	3	2 ³ / ₄	3½	2 ⁵ / ₈	2 ⁵ / ₈	2 ³ / ₈	2½	2 ⁵ / ₈	3	2 ⁷ / ₈	2'59
<i>Brussels.</i>													
Bank rate	3	3	3	3	3	3	3	3	3	3	3	3	3
Open market	2 ⁷ / ₈	2¾	2¾	2¾	2 ⁵ / ₈	2 ⁵ / ₈	2 ³ / ₈	2 ³ / ₈	2 ³ / ₈	2 ³ / ₈	2 ³ / ₈	2 ³ / ₈	2'57
<i>Hamburg.</i>													
Bank rate	4	4	4	4	4	4	4	4	4	4	5	5	4'17
Open market	3½	2½	3½	3¼	3	2 ⁵ / ₈	3½	2 ⁵ / ₈	2 ⁵ / ₈	3½	4½	3 ⁵ / ₈	2'9
<i>St. Petersburg</i>													
Bank rate	4½	4½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5'33

“Aided by the low rates for money that prevailed throughout the year, there was a revival of interest in Stock Exchange business in 1904 as compared with the stagnation that had prevailed in the three previous years. It was only by comparison, however, that the state of affairs could be called an improvement, for the incipient recovery was checked by the outbreak of the Russo-Japanese war in February, and at intervals by incidents arising out of that struggle. It was only for a limited period during the autumn that

business was really active, but still there was, on the whole, an appreciably better tone, and the average of prices at the end of the year was considerably higher than at the beginning.

"The price of Consols did not get so high, and went lower than the records of any of the four previous years. At the end of 1904, however, it was much nearer the highest than the lowest point of the twelve months, and was slightly higher than at the end of 1903. All other British Government stocks, except the Childers' Annuities, showed a gain on balance, and Indian Sterling stocks had also improved in market value, the most distinct rise occurring in the $3\frac{1}{2}$ per cent. stock. Bank of England and Bank of Ireland stocks were in each case much lower at the end than at the beginning of the year, for the obvious reason that the dividend had been reduced. The prices of the Metropolitan and London County Stocks improved considerably on balance, but British municipal stocks generally were neglected and out of favour, closing with a general loss of market value by comparison with the end of 1903. Somewhat similar conditions prevailed in the colonial market, but in that group the worst of the depression had been experienced previously, because some colonial stocks were, at all events, no lower in market value at the end of 1904 than twelve months before. Where declines had occurred it was mainly in the stocks of those States which had found it necessary to issue new loans during the year, and had to offer very attractive terms in order to get the money.

"The foreign market was not affected more than temporarily by the war in the Far East, except in regard to the bonds of the belligerent countries. Although the fighting went all one way, both Japanese and Russian securities receded in market value, as both Governments were under the necessity of issuing large new loans in order to provide means of carrying on the war. European Government stocks were generally well maintained in value, and a big improvement took place in the market value of Greek loans, owing to the increased return from the assigned revenues. A feature of the year was the extensive rehabilitation of nearly all South American and Central American securities. Mexico reached a high standard of credit, her five per cent. bonds going up to 105 and a new loan was floated on favourable terms. Bountiful harvests and more settled political conditions brought about a marked improvement of conditions in Argentina, Brazil, and Chili, and the securities of each of these States were much higher in value at the end than at the beginning of the year. There was a remarkable rise in the bonds of several of the defaulting States of South America without any corresponding improvement in the position of the creditors, if those of Colombia be excepted.

"The dividends paid by the leading British railways for the December half of 1903 were on the average somewhat lower than those paid for the corresponding period in 1902. Yet there was a considerable increase in the value of home railway stocks during the first half of 1904. This rise was partly justified by the fact that the dividends for the June half-year were rather better than for the corresponding period in 1903, but the improvement was, perhaps,

mainly attributable to an impression that prices had been allowed to go too low. There was no encouragement for a further advance during the last six months, as receipts showed a falling off, and there was a prospect rather of reduced than increased dividends. Still, the greater part of the advance secured early in the year was retained, prices being higher at the end than at the beginning of the year.

"In the American market there was one of those sustained and prolonged upward movements that are so difficult to understand in this country, since they cannot be justified by any interpretation of the circumstances affecting the prospects of the roads. Certainly, there was a big crop of cotton and of maize, but the wheat crop fell considerably short of that of the previous year, and there was no great activity in the trade of the United States. However, Wall Street apparently thought its securities were worth so much more, and though there was rather a sharp check to the advance just before the end of the year, values closed very substantially higher than at the end of 1903.

"The course of prices for Canadian railway securities in the past two years presents a curious study, for, whereas in 1903 there was a marked expansion in receipts and a fall in prices, in 1904 the process was reversed. The Canadian Pacific, however, has maintained its dividend at the 6 per cent. to which it was advanced in 1903, and while the Grand Trunk paid nothing on any of its preference stocks at the end of June, the dividend on the second preference for the whole year has been forthcoming. It was, however, the ordinary and third preference stocks, upon which at present no dividend is being paid, that increased most in market value during 1904. The advance occurred chiefly at the time the arrangements were concluded for building a new Transcontinental railway by the Grand Trunk, the new enterprise being entitled the Grand Trunk Pacific Railway.

"There was an even greater demand for Central and South American railway stocks than that which existed for the Government securities already referred to. The reason was the same—viz., the improved economic conditions, and, of course, the holder of railway ordinary stocks would derive more benefit from such improvement than would the holder of State bonds. In the case of the Mexican Railway, an unexpectedly large dividend was paid on the First Preference stock in November, and the price advanced by leaps and bounds. At the end of the year it was no less than $44\frac{1}{2}$ higher than at the end of 1903, the quotation being 108, as compared with $63\frac{1}{2}$. Argentine and Brazilian railways were also enormously higher in market value at the end than at the beginning of the year, and a great improvement took place in the securities of railways operating in Chili, Uruguay, Cuba, and the Philippines.

"A rise in trust stocks was the most noteworthy feature among the groups of Miscellaneous securities. Another was a big appreciation in Hudson's Bay shares, and the securities of land companies generally were in good demand. Gas stocks distinctly improved in market value, while a lowering of value occurred in iron and coal

companies' shares, tea companies, breweries, drapery, and warehousing and catering companies.

"The Mining markets were dull almost throughout the year. There were from time to time spasmodic efforts to start a boom in South Africans, but the checks were too strong. The gold output made steady progress, and good dividends were paid by a number of leading companies. These favourable features had, however, been sufficiently discounted in the prices to which the shares affected had been advanced in 1903, and so soon as values showed signs of moving there were rushes to realise shares that had been held for a certain price. Chartered shares were only a trifle higher at the end than at the beginning of the year, and while there was a big advance in the shares of some companies on whose properties the newly-discovered deposits were said to be located, the majority of Rhodesian shares showed a decline as compared with twelve months previously. Westralians closed the year lower in value than they began it, the output having in some cases diminished, and there were some further revelations as to miscalculations of ore reserves, which increased the distrust that had prevailed in connection with the management of this goldfield. Indian gold shares were fairly steady, but were somewhat lower in value on balance. Copper shares were a strong market throughout on account of the high price obtained for copper during the whole of the twelve months.

"There were symptoms at intervals during the year that the effects of the drain of the South African war were at length passing away, and that money was at last becoming available for investment purposes. The symptoms, however, proved to be of a more or less tentative and transient character, and it was only when particularly attractive terms were offered that there was any degree of alacrity in the public response. In the aggregate, the total amount of new capital offered for subscription was smaller, with the exception of 1903, than for any year since 1895.

"The following is a statement of new capital issues and actual money calls in the past as compared with previous years:—

[000's omitted.]

	Capital Created and Issued.			Actual Money Calls.		
	In England.	England and elsewhere.	Total.	In England.	England and elsewhere.	Total.
	£	£	£	£	£	£
In 1904....	106,403,	16,617,	123,020,	102,351,	2,591,	104,942,
" '03....	101,308,	7,155,	108,463,	92,093,	2,276,	94,369,
" '02....	140,050,	13,762,	153,812,	132,107,	9,814,	141,251,
" '01....	155,618,	3,720,	159,338,	132,903,	1,857,	134,760,
" '00....	160,953,	4,546,	165,499,	118,732,	12,456,	131,188,
" 1899....	124,192,	8,978,	133,170,	82,145,	8,144,	90,289,
" '98....	113,838,	36,336,	150,173,	79,789,	21,412,	101,201,
" '97....	115,612,	11,687,	157,299,	73,947,	7,747,	81,694,
" '96....	125,964,	26,713,	152,677,	66,111,	18,281,	84,393,
" '95....	91,694,	12,996,	104,690,	64,645,	19,855,	84,500,

"Although no longer borrowing for war purposes, the British Government raised a total of over 16,000,000*l.* The principal items in that were an issue of 6,000,000*l.* in Exchequer bonds for capital purposes under the Naval and Military Works Acts, two issues of Local Loans stock, aggregating 5,805,000*l.*, and a first issue of Irish Land 2 $\frac{3}{4}$ per cent. stock, amounting at 87, the price of issue, to 4,350,000*l.* A Transvaal Loan for 5,000,000*l.* in 3 per cent. stock, issued at 97 $\frac{1}{2}$, was essentially, though not nominally, a British Government issue, since the principal and interest were guaranteed by the Imperial Government. South Africa was very prominent in all kinds of borrowing, and out of a total of 17,718,500*l.* raised by different Colonial Governments, 13,495,000*l.* went to South Africa. India made only one issue for 2,362,500*l.*, and New Zealand one for 1,000,000*l.* It is significant that not one of the States included in the Australian Commonwealth appeared in the London market as a borrower throughout the year 1904.

"The following is a detailed statement of the year's capital applications classified as nearly as possible according to the purposes for which it was required :—

Capital Applications.

Description.	1904.	1903.
	£	£
British Government loans	16,083,000	1,970,000
Colonial ".....	17,718,500	33,356,200
Foreign ".....	29,969,700	8,633,800
British municipal and county loans	6,219,800	10,550,800
Colonial and foreign corporations	3,799,700	3,096,200
British railways	6,946,400	7,707,200
Indian and colonial railways	5,910,800	5,715,700
Foreign railways	8,786,200	1,020,800
Mining companies—		
Australasian	363,800	460,300
South African	1,996,800	1,347,100
West ".....	284,300	60,000
Other mines	645,200	834,700
Exploration and financial.....	3,673,300	2,202,300
Breweries and distilleries	1,641,300	2,275,000
Merchants, importers, and exporters	118,700	785,400
Manufacturing	2,912,000	2,080,000
Stores and trading.....	1,394,300	5,001,300
Estate and land.....	1,233,900	2,943,400
Iron, coal, steel, and engineering	2,196,200	4,909,500
Electric lighting, power, &c.	2,825,900	3,957,000
Tramway and omnibus.....	2,999,500	1,487,700
Gas and water	2,557,600	1,614,100
Hotels, theatres, and entertainments	496,200	1,612,900
Patents and proprietary articles	512,500	400,700
Docks, harbours, and shipping	1,204,300	1,347,400
Banks and insurance.....	3,449,000	2,414,200
Miscellaneous.....	865,800	679,200
	123,019,700	108,462,700

"The total amount offered by Foreign Governments during the year was 29,970,000*l.*, which compares with only 8,634,000*l.* in 1903. The increase was largely due to Japanese borrowing for the expenses of the war. Two loans were issued here, both Six per Cents., the first being for 5,000,000*l.*, at 93½, and the last for 6,000,000*l.* at 90½. On each occasion a similar amount was offered in the United States. The Republic of Cuba issued a loan amounting to nearly 7,000,000*l.*; the Chinese Government offered Imperial Railway bonds for 2,194,000*l.*, of which the bulk had to be taken up by the underwriters, the only other foreign loan being 731,000*l.* in 4 per cent. bonds, offered by the Greek Government at 84.

"Beyond a London County Council 3 per Cent. for 5,000,000*l.*, which was readily taken up at 90, British Corporations were unable to raise more than a small portion of the money of which they were in need, the total being only 6,219,000*l.* South Africa was very prominent in this section, since out of nine Colonial Municipal Loans for 3,800,000*l.* seven issues for a total of 3,283,000*l.* emanated from South Africa. The total for the British Railways was 6,946,000*l.*, for Indian and Colonial Railways 5,911,000*l.*, and for Foreign Railways 4,786,000*l.* None of this was for new undertakings, all being offered by existing companies.

"Mining ventures did not prove very attractive—at least, promoters did not think it advisable to bring forward new companies in any considerable number. Nearly all the capital was offered by existing companies, and here, again, South Africa was prominent, the amount raised for the Transvaal and Rhodesia being 1,996,800*l.*, to which should be added 3,673,300*l.* offered by Exploration and Finance companies, the whole of which was for South Africa. Mines in all other parts of the world offered a total of 1,298,300*l.* Promotions of ordinary joint-stock companies for industrial companies were on a limited scale, most of the capital in this section also being offered by existing companies. Breweries ceased to attract capital, having altogether fallen out of the race during the last five months of the year. Manufacturing companies applied for a considerable amount, the unsatisfactory feature of the group being that much of the money was asked for by undertakings in which a good deal had already been lost, such as Linotype and Machinery, Daimler Motor, and Woolcombers. Some portion of the sums offered by iron, coal, and steel companies was also in the form of Debentures, giving a charge upon undertakings which found themselves in urgent need of new capital. But the capital subscribed for electric lighting, tramway and omnibus, and gas and water companies had, as a rule, better prospects, and most of it was, in fact, subscribed for at a premium. The same remark applies to banks and insurance companies, the larger portion being offered by flourishing Egyptian banking institutions.

"One of the influences that operated in 1904 towards ease in the world's money markets, and thus aided as a stimulus to trade, was the increased production of gold. According to the *Engineering and Mining Journal*, of New York, that increase amounted to

nearly 5,000,000*l.*, distributed over the various sources of supply thus:—

	1904.	1903.	Increase or Decrease.
	£	£	£
United States.....	16,910,260	14,718,340	+ 2,191,920
Canada	3,482,000	3,766,898	— 284,898
Mexico	2,138,156	2,036,492	+ 101,664
Russia	4,500,000	4,996,064	— 496,064
Transvaal	15,582,732	12,251,856	+ 3,330,876
Rhodesia.....	928,083	813,087	+ 114,996
British India.....	2,289,175	2,228,014	+ 61,161
Australasia	17,352,746	17,841,484	— 488,738
All others	7,000,000	6,661,150	+ 338,850
	70,183,152	65,313,385	+ 4,869,767

“As the result of this expansion of the output the chief national banks were able materially to augment their stocks of gold, and thus provide a basis for additional issues of notes, or an enlargement of credits, or both. The stocks held by the various banks and certain national treasuries at the end of 1904 compared with those at the end of 1903 thus:—

	End of		Increase or Decrease.
	1904.	1903.	
	£	£	£
Bank of England	28,927,000	28,912,000	+ 1,015,000
Bank of France.....	106,345,000	94,454,000	+ 11,891,000
Imperial Bank of Germany...	46,363,000	39,673,000	+ 6,690,000
Bank of Russia and Treasury	123,900,000	105,800,000	+ 18,100,000
Austro-Hungarian Bank	48,004,000	46,232,000	+ 1,772,000
Bank of Italy	19,050,000	18,453,000	+ 597,000
Bank of Belgium	4,802,000	4,684,000	+ 118,000
Netherlands Bank.....	5,630,000	4,189,000	+ 1,441,000
Bank of Spain	14,883,000	14,544,000	+ 339,000
New York Associated Banks	41,710,000	32,230,000	+ 9,480,000
New York Treasury	34,344,000	53,114,000	— 18,770,000
	474,958,000	442,285,000	+ 32,673,000

“With regard to the silver market, Messrs. Pixley and Abell report that ‘the predominating feature of the year was again the large purchases made on behalf of the Indian Government.’ These carried the price early in the year to over 27*l.*, and when these orders temporarily ceased, the price did not greatly fall, as cash silver remained scarce, owing to covering orders by ‘shorts.’ In August, the Indian Government orders recommenced, and, with occasional pauses, continued to the end of the year. Sales by China had at times a somewhat flattening effect, but this was more than compensated for by the falling off of the American supply, owing to the requirements for the new Panama coinage, which

absorbed about 1,500,000 ounces. In November the Mexican Congress passed a Bill closing the mints to the free coinage of silver, with a view to gradually raising the value of the Mexican dollar to half that of the United States dollar. So far this measure has had no influence on the price of silver. The war in the Far East has led to a large demand for silver, both in Shanghai where considerable purchases have been made, and also in San Francisco for Mexican dollars.

"Large amounts of Mexican dollars continued to be shipped here from the Straits, but ceased before the end of January. Further importations of the coin into Manila were stopped on January 14th. Japan bought large quantities in San Francisco, but, as a rule, the quotation here remained more or less nominal until October, when further shipments were made from China to London. On the announcement of the passing of a Bill in Mexico, placing the dollar on a fixed basis, the price rose to 27*d.*, and all the dollars that were available here were at once shipped to Mexico, to take advantage of the premium obtainable over their intrinsic value. From 1st January, 1905, an import duty of 10 Mexican dollars per kilo. has been placed on all dollars sent into the country. It is proposed by the Mexican Government to coin the dollars of the same weight and fineness as before, and, further, to coin dollars for export, as required.

Monthly Fluctuations in Price of Bar Silver.

	1904.		1903.		1902.		1901.		1900.	
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
January	25 $\frac{1}{2}$	27 $\frac{5}{16}$	21 $\frac{11}{16}$	22 $\frac{3}{8}$	25 $\frac{7}{16}$	26 $\frac{1}{8}$	29 $\frac{9}{16}$	27 $\frac{3}{4}$	27 $\frac{11}{16}$	27
February.....	25 $\frac{3}{8}$	27 $\frac{1}{2}$	21 $\frac{7}{8}$	22 $\frac{5}{16}$	25 $\frac{5}{16}$	25 $\frac{1}{2}$	28 $\frac{1}{2}$	27 $\frac{3}{8}$	27 $\frac{1}{2}$	27 $\frac{5}{16}$
March	25 $\frac{1}{2}$	26 $\frac{11}{16}$	22 $\frac{1}{8}$	22 $\frac{3}{8}$	24 $\frac{13}{16}$	25 $\frac{7}{16}$	28 $\frac{3}{16}$	27 $\frac{5}{16}$	27 $\frac{11}{16}$	27 $\frac{7}{16}$
April	24 $\frac{7}{16}$	25 $\frac{1}{2}$	22 $\frac{3}{8}$	25 $\frac{1}{16}$	23 $\frac{5}{16}$	24 $\frac{1}{2}$	27 $\frac{15}{16}$	26 $\frac{11}{16}$	27 $\frac{1}{2}$	27 $\frac{5}{16}$
May	25 $\frac{3}{8}$	25 $\frac{5}{16}$	24 $\frac{5}{16}$	25 $\frac{1}{4}$	23 $\frac{5}{16}$	24	27 $\frac{5}{8}$	27 $\frac{3}{16}$	27 $\frac{5}{8}$	27 $\frac{1}{2}$
June	25 $\frac{5}{16}$	26 $\frac{1}{8}$	24 $\frac{1}{8}$	24 $\frac{9}{16}$	23 $\frac{5}{16}$	24 $\frac{7}{16}$	27 $\frac{9}{16}$	27 $\frac{1}{4}$	28 $\frac{1}{16}$	27 $\frac{9}{16}$
July	26 $\frac{3}{8}$	27	24 $\frac{1}{4}$	25 $\frac{1}{2}$	24 $\frac{3}{16}$	24 $\frac{9}{16}$	27 $\frac{1}{2}$	26 $\frac{13}{16}$	28 $\frac{1}{16}$	27 $\frac{1}{4}$
August	26 $\frac{7}{16}$	27	25 $\frac{5}{16}$	26 $\frac{3}{4}$	24 $\frac{1}{8}$	24 $\frac{1}{16}$	27 $\frac{1}{8}$	26 $\frac{3}{4}$	28 $\frac{7}{16}$	27 $\frac{5}{16}$
September	26	26 $\frac{7}{8}$	26 $\frac{1}{4}$	27 $\frac{9}{16}$	23 $\frac{9}{16}$	24 $\frac{1}{8}$	27	26 $\frac{7}{8}$	29 $\frac{1}{4}$	28 $\frac{7}{16}$
October	26 $\frac{1}{2}$	26 $\frac{5}{16}$	27 $\frac{7}{16}$	28 $\frac{1}{2}$	23 $\frac{1}{4}$	23 $\frac{11}{16}$	26 $\frac{7}{8}$	26 $\frac{3}{8}$	30 $\frac{3}{16}$	29 $\frac{1}{8}$
November	26 $\frac{3}{4}$	27 $\frac{1}{4}$	26 $\frac{1}{4}$	27 $\frac{5}{8}$	21 $\frac{11}{16}$	23 $\frac{1}{4}$	26 $\frac{3}{2}$	25 $\frac{3}{8}$	29 $\frac{15}{16}$	29 $\frac{7}{16}$
December	27 $\frac{3}{8}$	28 $\frac{9}{16}$	25	26 $\frac{7}{16}$	21 $\frac{13}{16}$	22 $\frac{3}{8}$	25 $\frac{1}{2}$	24 $\frac{5}{16}$	29 $\frac{3}{8}$	29 $\frac{1}{2}$
Yearly avege.	26 $\frac{3}{8}$		24 $\frac{9}{16}$		24 $\frac{1}{16}$		27 $\frac{3}{16}$		28 $\frac{1}{4}$	
Highest price	28 $\frac{9}{16}$		28 $\frac{1}{2}$		26 $\frac{1}{8}$		29 $\frac{9}{16}$		30 $\frac{3}{16}$	
Lowest "	24 $\frac{1}{16}$		21 $\frac{11}{16}$		21 $\frac{1}{16}$		24 $\frac{1}{16}$		27	

APPENDIX (A).—*Volume and Value of our Foreign Trade of 1904 compared with that of 1903.*

"For a number of years past it has been our practice to analyse the annual trade and navigation returns, so as to show to what extent the recorded movements in values have been due to variations in the volume of the year's trade, and how far to alterations in prices. The details of this analysis for the year 1904 will be found in the numbers of the *Economist* of the 21st and 28th

January, and we now, as usual, bring together the main figures, in order that the broad results may be more clearly indicated:—

I. Imports.

	1904.		1903.
	Value in Trade and Navigation Returns.	Value Calculated at Prices of 1903.	Value in Trade and Navigation Returns.
	£	£	£
Articles of food and drink	227,267,000	230,235,000	228,094,000
Tobacco	4,524,000	4,783,000	4,191,000
Raw materials and articles mainly unmanufactured—			
(a.) Iron and other metals	11,198,000	11,482,000	10,803,000
(b.) Wood	23,638,000	24,913,000	27,123,000
(c.) Textile materials	91,381,000	84,615,000	80,465,000
(d.) Oils and oilseed	25,281,000	25,896,000	24,461,000
(e.) Miscellaneous	30,712,000	29,369,000	30,657,000
Articles wholly or mainly manufactured—			
(a.) Metals and manufactures } thereof	37,320,000	38,121,000	35,918,000
(b.) Yarns and textile fabrics.....	37,462,000	36,636,000	38,152,000
(c.) Miscellaneous	60,369,000	62,550,000	60,494,000
All other articles, including parcel post	2,210,000		
Total imports.....	551,362,000	548,000,000	542,599,000
Less re-exports	70,322,000	67,871,000	69,573,000
Net imports	481,040,000	480,129,000	473,026,000

II. Exports.

Articles of food and drink	16,150,000	16,793,000	15,723,000
Tobacco	776,000	776,000	654,000
Raw materials and articles mainly unmanufactured	35,670,000	37,451,000	35,379,000
Articles wholly or mainly manufactured—			
(a.) Metals and manufactures } thereof	61,913,000	65,087,000	63,862,000
(b.) New ships	4,460,000	4,550,000	4,281,000
(c.) Yarns, textile fabrics, and apparel	129,567,000	122,121,000	119,191,000
(d.) Miscellaneous.....	48,003,000	52,171,000	47,451,000
All other articles, including parcel post	4,279,000		
Total	300,818,000	298,949,000	290,800,000

“ From the above tables it appears that the total value of the imports retained for home consumption in 1903 was 473,026,000*l.*, and that if we had paid for our net imports of last year the same average prices as in 1903, they would have cost us 480,129,000*l.* It follows, therefore, that there was last year an increase in the

quantity of our net imports equal to the difference between 473,026,000*l.* and 480,129,000*l.*, which is 7,103,000*l.*, or 1.50 per cent. Similarly with the exports. The total net value of British commodities sent abroad in 1903 was 290,800,000*l.*, while our exports in 1904, if we had received for them the same average prices as in 1903, would have realised 298,949,000*l.* There was consequently an increase of quantity in 1904 equal to the difference between 298,949,000*l.* and 290,800,000*l.*, which is 8,149,000*l.*, or 2.80 per cent. And taking imports and exports together, the volume of our foreign trade last year (exclusive of re-exports) shows, as compared with 1903, an increase of 2 per cent., the computation being:—

	£
Actual value of net imports and of exports of } British products in 1903.....	763,826,000
Value of net imports and of exports of British } products in 1904, calculated at the prices of } 1903	779,078,000
Increase in 1904, due to larger quantities...	15,252,000 = 2.0 per cent.

“Next as regards prices. Our imports for home consumption in 1904 were valued at 481,040,000*l.*, but if we had paid for them the same average prices as in 1903 they would have cost us only 480,129,000*l.* There was consequently an increase due to variation in price of 911,000*l.*, equal to 0.19 per cent. Put in the reverse way, the cost of our imports was on the average 0.19 per cent. greater in 1904 than in 1903. Applying the same method to our exports, the statement shows we received for British commodities sent abroad in 1904 a sum of 300,818,000*l.*, but that if these had realised the same average prices as obtained in 1903 the value would have been only 298,949,000*l.* Thus there was an increase due to higher prices amounting to 1,869,000*l.*, equal to 0.62 per cent. That is to say, we received in 1904 300,818,000*l.* for the same quantity of goods that we should have had to sell at the prices of 1903 for 298,949,000*l.* Bringing the totals together, the value of our foreign trade in 1904, exclusive of re-exports, was increased by 2,780,000*l.*, or 0.35 per cent., owing to higher prices. The calculation is as follows:—

	£
Value of net imports and of exports of British } products for 1904, calculated at prices of } 1903	779,078,000
Actual value in trade and navigation returns.....	781,858,000
Increase due to higher prices in 1904	2,780,000 = 0.36 per cent.

“In the final result the total increase in our foreign trade for the year 1904, amounting to 18,032,000*l.*, was made up as to 15,252,000*l.*, or more than five-sixths, of increased quantities of commodities imported and exported, and as to 2,780,000*l.*, or less than one-sixth, of increase in the prices paid for or received for those commodities, as compared with the previous year.

(B).—*Railway Traffic Receipts in 1904 and 1903.*

Subjoined is an analysis of the traffic receipts of fourteen of the principal English railways during the past two years:—

First Half-Year.

[00's omitted.]

	Passengers, Parcels, and Mails.		Merchandise.		Minerals.		Live Stock.	
	1904.	1903.	1904.	1903.	1904.	1903.	1904.	1903.
	£	£	£	£	£	£	£	£
London and N. Western	2,800,3	2,824,1	2,360,1	2,403,0	1,508,0	1,463,7	89,5	90,7
Great Western	2,628,8	2,537,1	1,434,8	1,404,6	1,567,4	1,510,5	73,5	77,1
Midland	1,765,2	1,748,7	2,171,3	2,204,6	1,526,6	1,496,2	50,8	48,0
North Eastern	1,343,4	1,331,0	1,490,4	1,450,3	1,436,3	1,467,0	50,5	51,1
Lancashire & Yorkshire	1,052,9	1,082,9	897,0	913,4	572,2	575,6	18,5	19,6
Great Northern	991,8	983,2	915,0	912,8	450,0	438,9	25,2	24,6
, Eastern	1,384,8	1,377,7	794,3	795,2	300,5	281,7	47,9	50,0
London and S. Western	1,475,6	1,465,4	475,4	458,8	227,2	210,3	18,2	18,7
South Eastern and } Chatham	1,526,0	1,503,7	324,9	312,4	200,0	190,2	8,9	9,0
London, Brighton, &c....	1,097,2	1,088,2	224,3	215,5	177,1	166,1	5,7	5,9
Great Central	473,5	461,7	592,5	588,3	501,5	474,7	10,6	11,6
North Staffordshire	126,2	127,1	136,8	140,5	149,1	155,8	2,6	2,5
Metropolitan	340,0	331,5	51,4	46,1	25,8	21,7	4	4
North London	153,9	159,5	66,5	68,6	28,9	29,0	8	8
Total	17,159,6	17,021,8	11,934,7	11,914,1	8,670,6	8,481,4	403,1	410,0
	+ £137,8		+ £20,6		+ £189,2		- £6,9	

Second Half-Year.

[00's omitted.]

London and N. Western	3,368,8	3,370,9	2,362,5	2,418,1	1,573,1	1,599,8	121,3	137,1
Great Western	3,161,2	3,104,5	1,466,9	1,468,3	1,584,8	1,561,1	80,7	86,3
Midland	2,029,8	2,025,7	2,179,8	2,229,0	1,562,6	1,623,3	50,5	53,5
North Eastern	1,690,4	1,668,7	1,455,3	1,490,1	1,470,4	1,501,8	50,4	54,0
Lancashire & Yorkshire	1,247,0	1,238,8	955,1	921,5	578,3	573,4	21,1	21,4
Great Northern	1,167,7	1,173,6	919,2	935,0	463,9	485,1	21,7	23,3
, Eastern	1,751,0	1,744,0	833,3	823,2	323,2	326,8	36,2	36,9
London and S. Western	1,733,7	1,718,4	487,5	497,9	229,9	224,4	22,9	23,2
South Eastern and } Chatham	1,803,9	1,795,9	355,4	348,0	200,4	206,6	10,9	11,9
London, Brighton, &c....	1,300,6	1,297,1	244,7	236,6	175,5	176,8	6,3	6,4
Great Central	558,1	540,5	595,4	600,3	530,1	505,2	9,4	10,6
North Staffordshire	139,5	141,4	131,3	139,5	142,5	147,6	2,4	2,7
Metropolitan	338,3	338,3	49,1	49,3	25,8	25,0	5	4
North London	149,2	160,4	66,2	70,4	27,5	30,9	8	9
Total	20,442,2	20,318,2	12,104,7	12,227,2	8,888,0	8,987,8	435,1	468,6
	+ £124,0		- £122,5		- £99,8		- £33,5	

(C.)—*Shipping Trade of the United Kingdom.**Vessels Entered and Cleared.*

		Over-Sea Trade.					
		Total Entered.			Total Cleared.		
		1904.	1903.	1902.	1904.	1903.	1902.
From and to—							
British pos-							
sessions }							
Foreign							
countries }							
Total ...							
		7,246,473	6,500,638	5,967,275	7,329,516	7,016,676	6,322,817
		33,695,124	33,393,379	31,937,038	41,136,848	40,383,290	38,479,271
		39,941,897	39,903,017	37,904,313	48,466,364	47,399,966	44,802,088
		Coasting Trade.					
		Entered.			Cleared.		
		1904.	1903.	1902.	1904.	1903.	1902.
British		31,836,729	31,217,802	31,269,626	31,384,864	30,837,673	30,930,932
Foreign		239,699	233,436	185,673	243,529	248,095	189,304
Total ...		32,076,428	31,451,238	31,455,299	31,628,393	31,085,768	31,120,236

VI.—*Notes on Economic and Statistical Works.*

Second Series of Memoranda, Statistical Tables, and Charts prepared in the Board of Trade with reference to various matters bearing on British and Foreign Trade and Industrial Conditions. (Cd-2337.) xiv + 594 pp., fcap., with numerous charts. Price 3s. 6d.

The length of the title is commensurate with the magnitude and variety of the contents of this bulky and inconveniently-bound volume. To review it adequately would occupy more than one issue of the *Journal*, and it is only possible to choose particular points for notice. Memoranda IX (Food Duties), X (Incidence of Foreign Tariffs), XI (Tariff Treatment), XV (Refunding Duties), and XVI (Kartells) merely carry further the treatment in Cd-1761, while the Appendices bring the figures there given up to date, and give a long, but unimportant, list of errata. V (Emigration), VI (Savings Banks), and VII (Prices of Cereals) call for no special discussion. III (Employment) and IV (Pauperism), in which are collected all the known statistics relating to these subjects for Germany, France, United States of America and some other countries, mainly go to show how impossible it is as yet to make

any authenticated comparative statements; but they contain a great deal of material necessary for forming an opinion, and will prove of considerable use as further information accumulates. We do not propose to deal in detail with VIII, which supplies much needed data as to the change of ocean freights, but needs expert interpretation, nor with XIV, which analyses the trade of Germany, France, and United States of America with protected and unprotected countries—except to point out that the remark (p. 383) “that the classification and level of the tariffs of several important European countries have been partly determined by commercial negotiations among themselves, in which the United Kingdom has had no share, so that it is possible that they are arranged to suit the trade of the negotiating countries better than our own trade,” is purely *à priori*, for no statistical or other analysis is given to show whether this possibility has been realised in fact. We are then left with I (Consumption of Food), II (Change in Cost of Living), XII (Classification of Imports and Exports), XIII (Consignment and Origin of Imports), and XVII (Distribution of Population).

I. In the first Fiscal Blue Book (Memorandum XVIII) a good deal of information was collected as to the expenditure of working-class families on various articles of food and drink, but the number of satisfactory returns for towns was inadequate. A further investigation has now been made, and there are tabulated the results of 1,944 detailed returns. Among these are included 136 returns from the earlier inquiry for London, and, as 68 of these are confessedly incomplete, it is not clear on what principle they were selected. As a result we have “a mass of information with regard to workmen’s expenditure and consumption in the United Kingdom of a much more comprehensive character than has ever been previously obtained.”

In discussing such an investigation one of the important questions is as the sufficiency and comparability of the data; for example, is the statement that in Scotland 10·50 per cent., and in London 9·99 per cent., of income was spent on bread and flour (the former based on 455 returns, the latter on 347), sufficiently exact to enable us to say that the percentage in Scotland was greater than in London? This depends on the variation of the individual returns in this respect, and without the raw material it is not possible to assign the degree of accuracy to these percentages. For incomes between 30s. and 35s. a week the percentages are 11·03 (London) and 10·75 (Scotland). The percentages for the districts are, of course, influenced by the number included at various wages; the more at the higher wage the less the percentage on bread. The numbers are tabulated both as to six districts and as to five wage groups, so that this particular question can be examined; but we have not the means of assigning accuracy to any of the numbers.

A “word of caution” is given as to the large size of the families whose income is over 40s. a week; one may be added as to the possibly unrepresentative character of the expenditure of wages under 25s., on the well-known ground that only the more thrifty are likely to furnish returns.

With these considerations in mind, we may now look at some of the main average results :—

Limits of Weekly Income.....	Under 25s.	25s. to 30s.	30s. to 35s.	35s. to 40s.
Percentage on food	67	66	65	61
Expenditure „	14s. 5d.	17s. 10d.	20s. 9d.	22s. 3d.
Quantity of—				
Bread and flour lbs.	28·4	30·0	29·4	30·0
Meat „	4·4	5·3	6·3	6·4
Bacon „	0·9	1·1	1·2	1·4
Milk pints	5·5	7·7	9·8	10·3
Cheese ozs.	10·7	11·2	12·6	12·3
Sugar lbs.	3·9	4·6	4·8	5·2
Tea, coffee, cocoa ozs.	12·0	15½	21½	22¾

* Figures of incomes over 40s. are not given, because they require correction for the number in the family.

It is to be noticed that the amount spent on food increases and the percentage diminishes as the income grows; that the quantity of bread is practically the same throughout, but that the quantity of the other commodities increases with income. The table suggests that enough bread is obtained with low incomes, enough meat and milk with incomes over 30s., but perhaps not enough sugar; but it is just for these comparisons that a measure of precision is wanted. In the various districts the amount of sugar varies from 4·5 to 5·6 lbs. for incomes between 30s. and 35s., and from 4·7 to 5·7 lbs. for those between 35s. and 40s.

Comparison with budgets of agricultural labourers and with the United States can be made with the help of the books reviewed on pp. 184, 195 below.

It is much to be regretted that sufficient information was not collected, or, at any rate, is not published, as to rent; the question is given on the blank form p. 28, but the answers are not to be found; on p. 32 it is assumed that rent is two-sevenths of the food expenditure.

II. *Change in cost of living.*—It is to be hoped that the index numbers resulting from this inquiry will not be used without very great care; for though much of the material is both new and good, it cannot be said that the great difficulties have been sufficiently faced, or the many grave problems finally solved.

As regards food, we need only remark that the index numbers are those published in “Wholesale and Retail Prices,” 1903. These relate to *London only*, and are based on the prices ruling in large distributing concerns; what their relation to retail prices in working-class districts, even in London, may be, is a matter of conjecture. A serious mistake has been made on p. 31, where the food index numbers are given, without qualification, as referring to London and large towns in Great Britain.

As regards fuel and light, it is to be noticed that candles, whose price fell little from 1871 to 1903, is given equal weight with gas,

which has fallen more, and petroleum, which has fallen to a quarter of its former price. Whatever the position in 1871, candles are only entitled to a rapidly diminishing weight, and the fall for lighting is accordingly underestimated.

It is impossible to believe, without further proof, that the items taken for clothing are representative. The index number is 108·5 for 1881, 100 for 1900, and is based on thirteen statements for woollen clothes, four for cotton, three for stockings, and five for boots and shoes. The 1881 index numbers are—woollen goods, about 106, cotton goods 112, stockings 112, boots about 109, 1900 being taken as 100. Sauerbeck's numbers in 1881 (taking 1900 as 100) are 157 for raw wool, 112 for raw cotton. How is it that cotton goods have fallen with the raw material, but woollen goods have fallen but 6 per cent., while wool has fallen by one quarter? The efficiency of manufacture has increased, wages in the woollen trades have changed little, the export demand has diminished, production for the home market increased, competition—home and foreign—has been active, and there seems no reason to think that the fixed expenses of manufacturing or the cost of distribution has increased. Till these questions are answered, and a similar analysis considered for the other goods, we cannot accept the index numbers as given. It is not for us to say whether the goods selected are not typical—they are certainly too few—or whether their quality has changed.

The section on Rent is the most valuable in this memorandum. It is true that several difficult questions are dismissed with a brief remark, where economists would disagree; but we have a new and very important group of statistics of the rent of houses in identical streets over a period of years, which will be of great value to all students of the subject. This group may be summarised as in the following table; the numbers excluding rates are calculated, it is hoped on a correct basis, from the material given.

Annual Rental Value of Houses in Identical Selected Working Class Streets, as Percentage of Value in 1901-02.

	Including Rates.		Excluding Rates.	
	1880.	1900.	1880.	1900.
London	88·5	100	99	100
Twenty provincial towns	92·7	100	97·6	100

It seems proper, from the economic standpoint, to distinguish rates from rent. Whether the houses have deteriorated in value, or the streets in repute, during the period can hardly be decided; but if not it appears that there has been no recent rise in rents for similar accommodation.

Other statistics are given, based on the reports of the Inland Revenue Commissioners, relating to the rise in rents of working-class houses in general.

Average Rental Value of Houses (1901-02 as 100).

	Including Rates.		Excluding Rates.	
	1880.	1900.	1880.	1900.
Under 3 <i>o</i> l. in London	89	100	93	100
„ 2 <i>o</i> l. in twenty pro- vincial towns	85	100	89	100
Under 2 <i>o</i> l. in Great Britain, excluding London	80	100	85	100
Same proportion of whole num- ber of houses* as were in 1882-83—				
Under 3 <i>o</i> l. in London	82	100	92	100
„ 2 <i>o</i> l. in twenty pro- vincial towns	85	100	88·6	100
Under 2 <i>o</i> l. in Great Britain, excluding Lon- don	76	100	81	100

* 56 per cent. for London, 90 per cent. for rest of Great Britain, 91 per cent. for provincial towns.

The latter half of this table has been obtained by the present writer by interpolation in the returns, and seems the truer measure of the change.

If the above principles and calculations are correct it appears that, speaking very roughly, urban rents paid by the working class have increased by nearly 10 per cent. in twenty years owing to improved accommodation, and another 5 to 10 per cent. owing to increased rates; but the figures given above are not altogether comparable, for rates make the most difference in the identical streets.

The above analysis shows how exceedingly difficult it is to construct a retail index number, even if we ignore the difficulty of distinguishing throughout between change of prices of identical goods and of goods ordinarily used. “Some element of this kind is, however, inevitably present in all calculations of changes in the cost of living.” (p. 46.)

XII. *Classification of Imports, &c.*—It is desired to call special attention to the various methods used for distinguishing between goods of various stages of manufacture. Questions of definition of considerable interest to the statistician are involved, and the results obtained should be used in place of previous calculations of this nature.

XIII. *Origin and Place of Consignment of Imports.*—It has long been a commonplace with writers on foreign trade that our import statistics do not show accurately the place of origin. Beginning on 1st January, 1904, importers have been asked to name the country of origin, as well as the country from which goods were shipped. The results for six months are given in this memorandum, and are of a very interesting and in some cases of a surprising nature.

The following table shows the difference between the two groups of statements for the principal European countries:—

Value of Imports into the United Kingdom, 1904 (First Six Months).

[00,000's omitted.]

Country from which Imported directly.	Country of Origin.					
	Russia.	Austria.	Germany.	Holland.	Belgium.	France.
	£	£	£	£	£	£
Russia	12,1	—	—	—	—	—
Austria	—	1,2	—	—	—	—
Germany	5	1,9	13,3	—	—	—
Holland	—	3	7,3	7,8	7	—
Belgium	—	4	2,8	—	7,5	3
France	—	—	2	—	—	22,2
Switzerland	—	—	—	—	—	—
Italy	—	—	—	—	—	—
Spain	—	—	—	—	—	—
Portugal	—	—	—	—	—	—
Totals	13,2	3,2	23,6	7,9	8,2	22,6

Country from which Imported directly.	Country of Origin.				
	Switzerland.	Italy.	Spain.	Portugal.	Totals.
	£	£	£	£	£
Russia	—	—	—	—	12,1
Austria	—	—	—	—	1,2
Germany	—	—	—	—	16,5
Holland	3	—	—	—	16,8
Belgium	1,5	6	—	—	13,5
France	2,1	7	1	—	25,9
Switzerland	—	—	—	—	0
Italy	—	1,8	—	—	1,8
Spain	—	—	6,6	—	6,6
Portugal	—	—	—	1,3	1,4
Totals	3,9	3,2	6,8	1,3	95,8
				94,6	

Thus, under the former system, goods to the value of 16,500,000*l.* would have been credited to Germany; of these 3,200,000*l.* worth in reality came from Russia, Austria, or other countries, while 10,200,000*l.* worth came from Germany, but would have been credited to Holland, Belgium or France; so that the total value for Germany was 23,600,000*l.* It will be seen that the assumption sometimes made that the total credited to Germany, Holland and Belgium together was correct is not justified; they would have been credited with 46,800,000*l.*, while 39,700,000*l.* only originated in them. It is much to be hoped that this important double classification will be continued.

XVII. *Distribution of Population by Industries.*—This memorandum is a very useful tabulation of census figures for eighteen countries. It is worth publishing separately instead of at the end of this oversized volume. The figures for the United Kingdom should be used, in place of the much misused figures given in Cd 1761. Here it is seen that the numbers in the iron and steel manufactures have increased 50 per cent. absolutely in twenty years, and from 239 to 301 per 10,000 of the population, statements which were missing in the earlier volume.

Space has only permitted notice of a few points in this encyclopædia of information. The Board of Trade are much to be congratulated on their great and continuous output of material of the greatest importance and interest alike to economist and statesman.

A.L.B.

Second Report by Mr. Wilson For on the Wages, Earnings, and Conditions of Employment of Agricultural Labourers in the United Kingdom. With Statistical Tables and Charts. (Cd-2376.) xii + 263 pp., fcap., with map and charts. Price 2s. 9d.

This is of the same nature and scope as the report in 1900 (Cd-346). Much additional information is collected, and the whole is very carefully and clearly tabulated, though there is some avoidable repetition. Agricultural labourers are much better paid than is generally represented; but even when full allowance is made for all extra earnings and all payments in kind (so far as these can be valued in money), the wages are below those of unskilled labourers in towns. The weekly averages in 1902 are estimated as 17s. 5d. in England, 17s. 7d. in Wales, 19s. 5d. in Scotland, and 10s. 9d. in Ireland for ordinary agricultural adult male labourers, excluding casual labourers. To these should be added, in very many cases, an additional sum, say 1s. 6d., for rent. Rent is generally taken as 1s. 6d. in the report; but the kind of house and garden the labourer gets can hardly be valued at less than 3s., including rates.

The following table may be compared with that given on p. 178 above for urban districts:—

Average Income and Weekly Quantity of certain kinds of Food consumed by Agricultural Labourers' Families in England, p. 226.

	Northern Counties.	Midland Counties.	Eastern Counties.	South and South- Western Counties.	Together.
Weekly income, about	20s. 6d.	18s. 1d.	17s. 3d.	17s. 10d.	18s. 3d.
Percentage on food	72	75	72	75	73
Expenditure „	14s. 10½d.	13s. 6½d.	12s. 4½d.	13s. 4½d.	13s. 6½d.
Quantity of—					
Bread and flour lbs.	28	34	37	38	34·4
Meat	5·1	5·1	3·8	4·2	4·5
Bacon	3·5	3	2	2·4	2·7
Milk (new) pints	6½	4	3½	4	4½
Cheese	12	17	18	26	19
Sugar	4·7	4·7	4	3·7	4·3
Tea, coffee, cocoa ... ozs.	9	12	7½	12½	10

Bacon and cheese form a larger part of the weekly ration than with the town labourer. More bread, more meat (including bacon and pork), more potatoes, more cheese, and more sugar, but less tea and less milk, are consumed by the agricultural labourer than by the townsmen with wages under 25s. (as shown in Cd-2337); but the townsmen with higher wages have a better ration than the agriculturist, especially in meat and milk. The comparison should be made in detail, and is of great interest, but the numbers here given are only based on 114 returns, too few for fine distinctions. Prices would require very careful handling.

The methods of paying the annual remuneration are legion; no generalisation can be made, but full information is to be found in this volume. It is interesting to find that the wage in the Scottish Border Counties is still mainly in kind in some districts. The terms of engagement are as various as the wages; it is curious to read that the weekly engagement customary in the South of England leads to more permanence than the half-yearly or annual engagements in the North. In the latter case it is apparently not unusual for the labourer and his family to change employers annually.

It appears that the Department is now kept informed of the ordinary weekly wages in practically all the rural districts of the United Kingdom, and details for 1903 are given in the Appendix, and if the publication now before us is periodic, we shall have very complete information as to the condition of agricultural labour. In the next issue it would be very useful to have a discussion as to the effect of higher wages in attracting labour. In Gloucestershire, for example, the range of wages is given as 11s. to 18s.; is there any flow of labour from one district to another? If the wages are set down district by district, instead of county by county, and the numbers of labourers in each district found for two different dates, and the weighted averages taken, would there be a greater rise shown than if the predominant rate for the county only were taken and the rates weighted by the county numbers? This may be a very important point, as in general in recent years wages have risen as much from the shifting of occupation as from rise in rates, and it may be they have also risen from shifting within the same occupation to localities of higher wages. The Labour Department has not as yet published any analysis of this possibly very important tendency. A further question which is well worth investigation is, how far the higher wages in certain districts correspond to greater efficiency of labour, and how far they are due to competitive demands for labour. Does the farmer in Stoke-on-Trent, who pays 18s. a week, get 20 per cent. more in return than his neighbour in Wolstanton who pays 15s., or is his rent on a lower basis or his market better? If the former, it is theoretically possible that the whole level of agricultural wages might be raised in a moderate time to 20s. a week, without the farmer losing.

The present and former report, together with the authorities enumerated in the *Journal of the Royal Statistical Society*, 1898, pp. 706, 707 and 711, and 1899, pp. 140, 141 and 396 give ample

information for a historical study of the conditions of agricultural labour. The very valuable series of wages paid on certain farms in England and Wales comprises 69 farms, giving information from 1850, as against 33 in the former report, and the number increases to 128 from 1876 onwards. The following table shows the differences between the results:—

Average Weekly Cash Wages of Ordinary Labourers on Farms in England and Wales as Percentages of their Height in 1892.

	Cd-316.	Cd 2376.			Index Number of General Agricultural Earnings: <i>Journal of the Royal Statistical Society</i> , 1899, pp. 163—4.
	33 Farms.	69 Farms.	128 Farms.	Eastern Counties.	
1850.....	70	69	—	74	71
'54-56	83	81	—	98	93
'60.....	83	81	—	92	87
'70.....	89	89	—	95	94
'74-77.....	102	101	102	111	116
'80.....	98	99	99	104	101
'90.....	97	97	98	95	97
'92.....	100	100	100	100	100
'96.....	98	99	99	95	96
'99.....	103	103	103	108	—
1903.....	—	109	108	113	—

It is thus seen that the increasing number of farms included makes practically no difference to the index numbers, and that the slow change of rates in times of inflation is still supported. This was discussed in the *Journal of the Royal Statistical Society*, 1903, pp. 598—601. The suggestion there made that the returns were either from farms where wages were specially regular, or that the earlier records ignored temporary changes, is partly supported by the details given in Appendix V and by the rapid changes shown in the Eastern counties. A rough tabulation for 135 farms shows that, when 1880 is compared with 1875-76, in 56 cases there was a fall (in 17 of more than 10 per cent.), in 42 cases the whole period is merged in one, in 16 the rates are unchanged, and perhaps in 21 there was a rise. This indicates that the fall is considerably more than the 2 per cent. shown in the average. The actual course for labourers in general lies, perhaps, between the two estimates.

A.L.B.

The Progress of the German Working Classes in the last Quarter of a Century. By W. J. Ashley. xiii + 164 pp., crown 8vo. London: Longmans, Green, and Co., 1904.

The purpose of this brochure, we are told, is to “clear the air in the fiscal controversy.” With this object in view Professor Ashley addresses himself to the establishment of two positions. He tries to show that a comparison between the condition of the German people and the people of Great Britain is a “far more

difficult and dubious affair than is supposed," and that the "balance of advantage" is not "indisputably in favour of this country." But the second more positive and more important part of his argument follows this negative criticism. "Whatever," he urges, "may be the comparative position," "Germany has actually witnessed a great advance in the wellbeing of the masses of her people within" "a period during which she has also been pursuing a policy of Protection." Three chapters of the five contained in the book are occupied with the second portion of the argument. In one the actual progress of the German agricultural working-classes, and in another that of the workpeople in German manufactures, are reviewed; while in a further chapter those general criteria of growing prosperity to which appeal is usually made, such as the deposits in savings banks, the consumption of articles of food, and the decrease of the death-rate and of emigration, are investigated. In his concluding chapter Professor Ashley examines the depression which occurred in Germany in 1901-02; and he has little difficulty in proving that it had more of the characteristics of a passing phase than of those of a permanent condition, although great use has been made of it for controversial purposes.

That a very opportune and necessary work has been performed in the preparation of this little book no one acquainted with the bold statements constantly put forward on political platforms and in various articles and pamphlets will dispute. For statistical students will not fail to appreciate the knowledge and admire the skill with which Professor Ashley has here both demonstrated the abuse and exemplified the use of evidence based on figures. His first chapter might serve as a lesson in statistical technique; and his declaration that the "science of statistics in relation to workmen's earnings is yet in its infancy" will not be questioned by the practised statistician, who will perhaps hardly regard as too severe the strictures passed on the inadequacy of the data furnished in this connection in the first Fiscal Blue Book. The difficulties indeed which beset all international comparisons may be summarised in the statement that we can rarely obtain data which are really comparable; and these difficulties are forgotten or ignored by many controversialists. Professor Ashley himself, as we should expect, is careful at each stage to indicate the limits of legitimate inference, and will not press his contentions knowingly beyond the bounds of safe deduction. He succeeds however in showing valid cause for a suspense of judgment on the question whether the position of the German working man is or is not worse or better than that of the Englishman with whom he should rightly be compared, and he utters a most necessary caution when he urges that the German data often cited, even in our Blue Books, refer not to the immediate present but to a more or less distant past.

In the second portion of his argument he moves to less treacherous ground, although with similar discretion he here abstains from the unwarrantable assertion that the advance made by Germany under Protection can be definitely ascribed to the single influence of her fiscal policy alone. A probable connection of

certain ascertained effects with a special fiscal policy can, it is true, be established with no little show of reason, and at any rate the negative argument that Protection has not proved a hindrance gains new force from the fresh evidence gathered together in this book. Of the marked progress made by Germany in recent years no particle of doubt can be entertained; for the testimony on this point is cumulative. Perhaps however the most novel and significant piece of evidence which Professor Ashley himself adduces is the significant change in the programme of the German socialist party: for they have been forced by the unanswerable logic of accomplished fact to abandon their ancient creed, which held that in agriculture the small peasant was bound to disappear before the aggregation of large properties, and that the status of the average working man in manufacturing centres was doomed to inevitable deterioration. Professor Ashley's own opinions on the fiscal question are well known, but he has not shut his eyes to the considerable risks, if he has appreciated the imperative necessity, of change; and this attitude is preserved in the Preface to the present book. We may therefore with some confidence entertain the hope that by their perusal of his new contribution to the discussion, many readers may be led to form a calmer judgment of the facts, and attain a juster sense of the true proportions of the issues raised. L.L.P.

International Trade: an application of Economic Theory. By John A. Hobson. xii + 202 pp., crown 8vo. London: Methuen and Co., 1904.

Among the immediate consequences of the fiscal controversy the re-examination of the traditional theories of international trade and value occupies an important place. To some inquirers the result of that examination must have been surprising and even disappointing: for it can hardly be denied that the later refinements of economic speculation have hitherto been sparingly employed in these departments. At any rate, certain conceptions have not been adapted to the exposition of international exchange with the systematic thoroughness with which they have been utilised elsewhere. Mr. Hobson in this book, for instance, emphasises the ideas of marginal cost of production and of marginal utility, and he believes that he is justified in claiming on these grounds some originality for his mode of treatment. He also brings to bear on international trade that broader notion of rent, which is no less prominent a characteristic of recent general theory; and, lastly, he accords distinct recognition to the presence of monopoly. By these additions to the common treatment of the subject he imparts a welcome freshness. His book, in the current slang, is brought more "up to date;" and professional economists might, we think, learn something from its pages, whether they did or did not agree with every conclusion which he draws or approve of all the successive stages of his argument.

Yet a doubt may be suggested whether the introduction of these new improvements is calculated to make this little book intelligible to the unprofessional readers for whom it is specially

intended; and a more sparing use of the "technical language of economic science" would perhaps have been more suitable to this immediate purpose. We are hardly doing an injustice when we say that it is practically impossible for "he who runs to read" Mr. Hobson's writing with the confident assurance that he has obtained a firm grasp of his meaning. There are portions of the reasoning in this book the correctness of which we should be inclined to question, could we be positive that the error did not lie in our own lack of apprehension. This difficulty of interpretation is hindered rather than assisted by the technical terminology employed.

There are other places where we think that a more comprehensive mind perhaps might have legitimately pushed conclusions to a further point, and there are others where we feel that a keener perception could have discerned certain differences which are, as it is, overlooked. For instance, we imagine that a "convinced free-trader" would not be very comfortable about some breaches made by Mr. Hobson in traditional free trade theory, and yet he generally arrives at a conclusion which robs protectionist objections of all their pertinence. He does not countenance the vulgar notion that the burden of an import duty must fall entirely on the consumer, and he recognises the important difference prevailing in this respect between the bestowal of a preference on one or more competing external sources of supply and the imposition of a tax solely protective to home production. And yet, as the fundamental bases of his argument, the familiar assumptions of extreme adherents of pure *laissez-faire* can be discovered. He argues generally as if "interference" with a "natural" order of affairs reached by unassisted and unhindered competition must result in a decreased production, and as if a protective tariff can never avoid a diversion of industry and commerce from "economical" into "uneconomical" directions. With similar inconsistency, as it appears to us, he first emphasises the presence of monopoly as a conspicuous force in the world of modern economic theory and business practice, and then minimises its importance in the special sphere of international exchange. He dismisses indeed with a brief footnote the influence which may be exerted on the terms of trading bargains between traders of different nationalities by the concentrated power of those Trusts whose existence, guaranteed by a protective tariff, he regards elsewhere as a necessary preliminary to effective "dumping."

He is certainly in accord with Continental thinkers in treating international exchange as governed by the same fundamental forces as those which regulate "domestic" value; and, as he urges, "non-competing" groups can be discovered within the boundaries of a single country, while his strictures on the difficulty of J. S. Mill's exposition of international value are deserved. Yet he himself goes too far, perhaps, in the other direction when he treats nations as the less conspicuous instances of these groups. Nor are some of the particular theories which he puts forward entirely convincing. Into this discussion he introduces once

again his favourite notion that the true cure for unemployment is to be found in a more liberal spending in lieu of saving; but once again he appears to ignore or underrate the circumstance that in a modern business world many, if not most, forms of saving necessarily involve concurrent spending. He lays down as an absolute rule the thesis that as countries progress more labour and capital will be turned from export trade to the business of transport, distribution and non-material production; but this suggestion, which is no doubt deserving of attention, would gain rather than lose in force were it less dogmatically expressed.

L.L.P.

Imperial Fiscal Reform. By Sir Vincent N. P. Caillard. xx + 288 pp., crown 8vo. London: Edward Arnold, 1903.

This presentation of the general case for fiscal reform possesses certain qualities which are, we think, calculated to commend it to the attention both of friends and of foes. It is a comprehensive review of the different aspects of the problem made by an author who, so far as we can judge, has spared no pains to acquaint himself with most, or all, of the data relevant to its consideration. It is also a temperate statement of the argument for change advanced by an advocate who has devoted close attention to the counter-pleadings of the opposing side. We are not surprised to find in Sir Vincent Caillard's pages the admissions, granted by authoritative economists before the present controversy arose, of defects in the traditional statement of free trade theory. But he also criticises with effect current representations of protection as necessarily encouraging remissness. He questions the familiar contention that capital and labour driven from one employment by foreign competition will necessarily discover "something else" to which they may more advantageously direct their energies. He combats that useful weapon of controversial argument, which utilises the prejudice against food-taxes, by emphasising the distinction between preferential and other duties; and he advances a theory regarding the actual incidence of such a preferential tax which is based on the proportion of the total supplies furnished by the taxed and by the favoured sources respectively.

Some of these arguments have now gained the status of commonplaces by dint of frequent reiteration during the past two years. But those who are familiar with the chief contentions of reformers of our fiscal system, will find a welcome vigour and lucidity in Sir Vincent Caillard's exposition, and some may perhaps be glad to embrace the opportunity supplied for strengthening their convictions. Nor will other readers who have not hitherto been convinced, and are resolved to disagree, deny the skill and force with which Sir Vincent urges his contentions. They may decline, for instance, to be influenced by the consideration which he puts in the very forefront of his book, when he pleads that the increasing burden of existing modes of raising revenue renders the discovery of new sources necessary. They may refuse to acknowledge the significance, if they are not disinclined to admit the real existence, of a "slackening" in our export trade, or a decline from

our industrial pre-eminence. They may not regard the risk of being cut off in war from foreign supplies of food as serious, or the chance of loss of our shipping business as appreciable. They may reject as groundless or misleading the idea that trading ties can be employed to render firmer and more enduring sentimental bonds which knit together the several portions of the Empire. In short, they may oppose an unvarying negative to the main counts of the case for reform presented in this book, and yet they may nevertheless admire the mode of presentation.

Sir Vincent Caillard tells us in his Preface that he had contemplated a larger volume, and that that now published is but an instalment, the appearance of which was hastened by Mr. Chamberlain's propaganda; and no careful reader will doubt that it is the outcome of long reflection on the fiscal problem. In the general arrangement of material indeed he is, perhaps for this very reason, less successful. He writes, of course, as an avowed opponent of our present fiscal policy, but he is a preferentialist rather than a protectionist, and looks forward to a trade within the Empire freer than that which now prevails. Perhaps the special novelty of his treatment lies in his examination of the old colonial preferences; for he endeavours here to meet a criticism commonly advanced, which urges that an Imperial Fiscal Policy is only the revival of a system tried, found wanting, and abandoned. Sir Vincent Caillard, in reply, emphasises the differences between the conditions now obtaining and the circumstances under which the former preferences were granted. For this reason he dismisses objections based on misty recollections of the past. In a similar spirit he discounts alarmist apprehensions of the future, which allege that we should be sacrificing immediately an extensive foreign trade in exchange for a small colonial business. Imperial trade, he urges, should properly be regarded as progressive, and not as stationary, and we must prepare for gradual rather than catastrophic changes in the direction of our business. We may nurse a favourable connection without danger, and the peril lies in neglecting to make opportune provision in such quarters for threatening or realised loss of trade elsewhere. L.L.P.

Modern Tariff History, Germany, United States, France. By Percy Ashley; with a Preface by the Right Hon. R. B. Haldane. xxiii + 367 pp., 8vo. London: John Murray, 1904.

This book is a noteworthy contribution to the literature of the fiscal question, for it furnishes material necessary to a correct decision in a convenient form. It is true that neither from the main body of the text, nor from the introductory preface, can bias be said to be wholly absent. But such an ideal of impartiality is probably now beyond the reach of most writers on a topic which has become the subject of such persistent, keen, and general discussion; and, if the Preface may be described as polemical, the obvious purpose of the succeeding chapters is to inform rather than admonish. Mr. Ashley conscientiously aims at neutrality, if Mr. Haldane is a partisan. In fact we conceive it to be possible

that some readers may not draw from their perusal of Mr. Ashley's narrative the precise moral which Mr. Haldane has discovered.

Nor with the letter of many of the introductory remarks would, we imagine, followers of Mr. Chamberlain be less likely to agree than those free traders who share Mr. Haldane's views; and some of these remarks may be cited as indications of the value of the book as a contribution to the fiscal question and as an addition to economic history. Enlightened tariff reformers would, for example, probably give their assent to the assertion that "much good has arisen from the fact that men and women have been forced to bend their minds on a topic of momentous importance and to think as closely as they are capable of doing." Few attentive observers can doubt that a fresh interest in economic reasoning has latterly been evident in quarters where it had been unfamiliar or unknown. Nor, if they were candid, would they be unwilling to make the further admission that this popular practical discussion must exert a reflex influence on the academic studies of scientific theorists. Here again, whatever may be thought about the particular fiscal creed which Mr. Haldane has embraced, his statement that the "public" has grown "discontented with arguments and conclusions, however eminent their authors, which belonged to days that" are "past," would, we are confident, command a ready agreement from many controversialists on either side.

Yet such observations as those already quoted are less pertinent to the immediate subject of the present volume than others which succeed; for not only has the fiscal controversy prompted a closer inspection of economic theory, and led to a more exact appreciation and a more discriminating statement of current doctrine, but it has also awakened a new lively interest in economic history. As Mr. Haldane proceeds to observe, people have "learned that the problem" which they are now considering is not "original," but that on the contrary it has for a "century past been occupying the attention of acute minds abroad, with the most varying and far-reaching results to national policy." "They began," in consequence, he adds, "to see that political as well as economic aspects had been and must be taken into account." We do not doubt that this statement would find complete acceptance with many advocates of reform in our own fiscal system. Mr. Haldane indeed shifts his position when he adds that the "problem for Great Britain began to display itself as highly complex and full of ramifications on which the analogy of other countries with different political and geographical conditions could at best throw a very dim light." But some of his opponents might perhaps be even more ready than some of his own friends to insist that the "most careful scrutiny and weighing were at every point essential;" and he himself admits that "Germany, the United States, and France have all considered the problem" presented to this country "both on its economic and on its political side," and that these cases, if "examined by an adequate method," can furnish much that is "in the highest degree instructive." Few, we imagine, would quarrel with his identification of the "historical method"

as the method which is "adequate," or reject his short description of that method as the "plan of examining the state of things to be inquired into in connection with its past and in the light of all materials which can show why and by what steps it has come about."

It is this "historical method" which Mr. Ashley applies in the chapters which follow Mr. Haldane's Preface; and we have quoted these preliminary observations, not merely because they seem to point to welcome possibilities of agreement on the mode in which the present controversy should be generally conducted, but also because, we think, they may serve appropriately to emphasise the value of this particular contribution to the discussion. The only ground indeed on which a quarrel might, we suspect, be successfully raised with Mr. Haldane is that, in spite of the fair profession of utterances like these, he contrives on the concluding pages of his Preface to show with tolerable distinctness that he himself has prejudged the question, and that no opposing evidence from the past or present experience of other countries would now suffice to make him alter his decision about the future fiscal policy of the British Empire or the United Kingdom. This unfortunately is the very disposition which has hitherto been the most serious obstacle to fair and full inquiry, and the book now before us derives especial value from the circumstance that it presents, in a form convenient for investigation, material which is essential, not to the confirmation of a previous judgment, but to arrival at an independent verdict based on an unbiassed scrutiny of the actual facts. Mr. Haldane's subsequent practice in short appears to us to conflict with his earlier profession. Readers might perhaps be advised on that account to reverse the usual order of perusal, and to abstain from studying the Preface, or, at any rate, the later paragraphs, until they had completed their own examination of the facts in Mr. Ashley's chapters; for they would thus secure a better chance of escaping the contagion of the bias which Mr. Haldane's example, though not his precept, might communicate.

An acute critic might indeed, also detect small traces of the influence of bias in a few parts of Mr. Ashley's treatment. But it is so far from being conspicuous or prejudicial to a satisfactory presentation, that, as we have said, we believe it to be possible that some readers may draw from his historical narrative a different moral from that suggested by Mr. Haldane. Mr. Ashley has, we conceive, approached and handled his subject generally in the true spirit of that historical method which Mr. Haldane describes as alone adequate to yield instruction. He has sought to place his readers in possession of the actual circumstances by which the modern tariff history of Germany, the United States and France has been successively moulded. He has endeavoured to furnish them with some of the more important material necessary for forming a broad reasoned judgment on the problem or problems now before this country. As proof of his desire to be impartial we may notice that in the case of the United States he quotes such contrary authorities as Professor Taussig and Mr. Stanwood. As evidence

of his wise resolve to supply an adequate narrative, we may point to his careful survey of the whole course of German fiscal policy from the formation of the Zollverein to the introduction and discussion of the new tariff. He has arranged his story in convenient clear divisions. He has managed, without overburdening his account with unimportant detail, to impart an accurate acquaintance with the salient characteristics of the measures passed from time to time. Nor has he neglected to present an adequate review of the motives prompting these successive changes, as acknowledged by their authors, and of the various currents of opinion amid which this legislation was carried into practice. The work which he has thus accomplished had before, at any rate in the case of Germany and indeed of France, been inaccessible to English readers in so compact and satisfactory a shape.

And thus presented no discriminating reader can deny that it will be found useful, if it is not indispensable, to those who would know for themselves the various important bearings of the fiscal problem. That the political aspect of the question has been more conspicuous than the economic through the different periods of German tariff history will not serve to differentiate the problem which British statesmen have to solve from that which interested Bismarck; for the claims of the unity of Empire and the necessity of an enlarged revenue are common to the two. That the German economists, whose opinions Mr. Ashley summarises, have not been content with the sharp distinctions between alternative theories or policies which once found favour in the dominant economic circles of this country, will not deter the modern English student from close deliberate consideration of their views. And, similarly, the great progress which the United States have made in industry and commerce, as contrasted with the recent slow advance of France compared with Germany or England, will be here investigated by the statistician, freed from the hampering influence of the common but ill-founded supposition that effects can usually be definitely ascribed to the isolated action of single causes. For, if it be argued, as it may, that protection has not manifestly assisted France, it may also be contended that it is by no means incontestably established that the United States would have been more prosperous without protection. Such neat responses as the uninstructed seek are in fact impossible in such complicated questions. Experience, as Mr. Haldane has affirmed, must be scrutinised, and scrutinised again, with pertinacity. And yet, if the light thus shed be, as he argues, sometimes "very dim," to remain content with the greater darkness prevailing in its absence is a perversely gratuitous rather than a necessary conclusion. With Mr. Ashley's effective aid at any rate we are enabled to ascertain the sources of illumination, and even to gauge their candle-power; and by these means he has made a valuable contribution both to the immediate fiscal controversy and to permanent economic history. He has in our opinion earned the gratitude not merely of free traders or of tariff reformers, but also in an especial degree of economic students, and his book should find a permanent position on their shelves.

L.L.P.

Protection in Germany. By William Harbntt Dawson. 259 pp., crown 8vo. London: P. S. King and Co., 1904.

The author of this book is the editor of the series of which it is the first instalment. That series is intended to furnish brief but adequate accounts of "Protection in various Countries." It is perhaps not illegitimate to draw from the selection of the title the inference that the demerits rather than the merits of the fiscal policy described will receive the greater emphasis from most contributors to the series; and in the "prefatory note" of the present volume at any rate the bias of the writer is avowed. For Mr. Dawson observes that, although it is a "sound and just maxim" that "history should be written without tendency," yet, "when a tendency is implicit in history, it is a dishonest affectation of impartiality to omit to bring that tendency to light." It is certainly evident through much of his narrative that he is unable, if he is not unwilling, to banish from his mind the use to which the facts he is recounting can be put in support of one side of the fiscal controversy. In his concluding chapters he endeavours to prove that the condition of the working man in Germany under Protection is inferior to that of the English working man under Free Trade; and, to his own satisfaction at least, he demonstrates that Protection in Germany has failed to realise some of the more important objects it has sought, even in connection with that agriculture which it has particularly fostered. These contentions are controversial; and something might be urged in qualification of some at least of these conclusions by those who disagree with Mr. Dawson, while in any event it might perhaps be doubted whether the limits set by the small dimensions of his book admit of the production of sufficient evidence or of adequate inquiry into its significance. Two questions may be raised with reference to such comparisons; and an affirmative answer to the first does not involve a similar response to the second. For we might arrive with Mr. Dawson at the decision, that the present economic status of the German working man compared unfavourably with that of an Englishman of the like description, and yet leave undecided the further problem of the determination of the cause, or causes, of this difference. It is not easy to answer the first question satisfactorily; the second raises the serious difficulties which are connected with what logicians call the plurality of causes and the intermixture of effects. Mr. Dawson hardly seems to show a full appreciation of these difficulties, although he is not ignorant of their existence.

Yet the bias which he avows does not attach to all parts even of his examination into the effects of more recent German fiscal policy; and the historical account, of which his book mainly consists, may with justice be regarded as a faithful record of the sequence of events, of the actual changes which have taken place at different times in the tariff, and of the acknowledged motives by which the authors of those alterations have been influenced. On the precise consequences of the successive policies which Germany has followed during the last century different opinions may no doubt be formed, and they may not always coincide with those

expressed by Mr. Dawson in this book. But the copious extracts which he gives from the utterances of Bismarck furnish ample illustration of the reasons which prompted and directed the action of that statesman in fiscal matters. The curious observer may detect instances of general similarity, if not of literal identity, between the thoughts and even the expressions of the German Minister and Mr. Chamberlain. Of this at any rate there can be no doubt, that Bismarck was largely influenced by political considerations, and especially by the desire, which was gratified, to secure financial independence for the Empire, freed by means of the abundant revenue from customs duties flowing into the Exchequer of the Federal Government from the humiliating and even dangerous necessity of relying on the "matricular contributions" of the separate States. In this aim he was in fact entirely successful, and only within recent years has an increased expenditure reintroduced the older situation. Mr. Dawson's narrative of this past history is lucidly arranged and vigorously told, and it can hardly fail to secure and to retain the attention of many readers in this country. It should, however, be noted in conclusion that he is careful to address to such readers a further caution: "Freedom of trade," he observes, "has been the exception" in Germany, and "when it has occurred it has been a temporary lapse from continuity and custom." It is in the light of this proviso that we must interpret German fiscal policy, and we have therefore ourselves to blame if we reason too hastily from the records of that foreign past experience to the requirements of the present or the future economic or political situation of the British Empire. But, approached in this discriminating fashion, an attentive study of the facts and the opinions of other nations may yield no small profit, and Mr. Dawson may accordingly be generally congratulated on the commencement of the series, of which he is the editor, with the particular volume of which he is the author. L.L.P.

Facts and Figures. The Basis of Economic Science. By Edward Atkinson. 202 pp., 8vo. Cambridge (U.S.A.): The Riverside Press, 1904.

This is written with Mr. Atkinson's well known vigour and freshness, but it is of too polemical a nature to call for much notice here. His main contention is that the number of persons who gain by existing protective taxation is very small. Only 1,000,000 out of the 29,000,000 persons engaged in gainful occupations in United States America could be included in a category subject to foreign competition. His actual classification (p. 42) shows at once his style and his argument:—

“Class I.—Persons who cannot be subjected to foreign competition, but who pay their proportion of duties on imports and of the enhancement of prices brought into effect by protection	26,077,822
Class II.—Persons not subject to foreign competition, whose industry in many branches would be promoted by the abatement of duties on materials of foreign origin used by them	2,396,295
Class III.—Persons occupied in arts which would require a re-adjustment if all duties were suddenly removed, which no one proposes	600,000
	<hr/> 29,074,117”

The addition of the round number to the units is typical of the mingled precision and guess-work of the argument.

It may be presumed that persons who did not agree with Mr. Atkinson's views would not accept his classification. Perhaps we can hardly object to his calling himself a protectionist when his whole work is directed to promote Free Trade, when just the converse can be observed at home.

Several of the digressions from the main polemic are of considerable interest. The description of the relations between New England and the maritime State of Canada (p. 29), the estimate of the national income of United States America at \$18,000,000,000 (p. 73), the analysis of change of occupation, and the observation that there are more farmers than farm labourers (p. 79) are cases in point. It is pointed out (p. 81) that the census figures show a tendency to the increase of small workshops side by side with the growth in the industries of immensely large factories. We may quote the general observation on p. 128: “By far the larger portion of the manufactures of this country have established themselves according to the conditions of each State, of each section, almost of each city, varying in kind under conditions of climate, soil, proximity of fuel, and all the other elements, mostly in total disregard of any duty on a foreign product, growing from the soil in the nature of the case, as incapable of suppression as any other art that goes to make up the material civilisation of a State, or a country.” A.L.B.

Eighteenth Annual Report of the Commissioner of Labor, 1903. Cost of Living and Retail Prices of Food. 865 pp., 8vo. Washington: Department of Commerce and Labor (U.S.A.), 1904.

Information has been collected as to the incomes and expenditure of 25,440 families, chosen in the various States in proportion to the industrial population. The schedules were issued and collected by special investigators familiar with the localities concerned, who verified as far as possible the information given. The results are tabulated in a long series of tables, showing the expenditure by persons in various trades, of several nationalities by birth, by the *personnel* of the working family, by size of income, &c. These tables are of exceptional interest, as they can be compared at once with those given in Cd-2337 and Cd-2376, noticed above.

Taking the general average for the United States, we have the following table :—

Expenditure in 11,256 Families, of Normal Constitution, by Number, &c., per Cent. of Income (pp. 101 and 285).*

Annual Incomes.	Rent.	Fuel and Lighting.	Food.	Clothing.	Other Purposes.	Per Cent. of Heads of Families (24,402) with Incomes shown in 1st Column.
Under \$200	16·9	8·0	51	8·7	15·6	1·5
\$200 or under \$300	18·0	7·2	47	8·7	18·8	3·0
\$300 „ „ \$400	18·7	6·1	48	10·0	16·1	8·4
\$400 „ „ \$500	18·6	6·7	47	11·4	16·5	16·8
\$500 „ „ \$600	18·4	6·2	46	12·0	17·2	17·9
\$600 „ „ \$700	18·5	5·8	43	12·9	19·4	17·9
\$700 „ „ \$800	18·2	5·3	41	13·5	21·6	16·8
\$800 „ „ \$900	17·1	5·0	41	13·6	23·0	6·2
\$900 „ „ \$1,000	17·6	5·0	40	14·3	23·2	6·2
\$1,000 „ „ \$1,100	17·5	4·9	39	15·1	23·7	} 5·4
\$1,100 „ „ \$1,200	16·6	4·7	38	14·9	26·1	
\$1,200 or over	17·4	5·0	36	15·7	25·4	
Total	18·1	5·8	43	12·9	20·1	—

* Husband at work ; wife living ; not more than five children, and none over 14 years ; no dependent, boarder, lodger, or servant.

Consumption of Food ; Average for 2,567 Families, with Average Annual Income \$8·27. Average Number of Persons in Family 5·3 (pp. 30 and 31).

	Weekly Quantity Consumed.	Weekly Cost.
		\$
Meat (other than hog-products)	9·0 lbs.	1·27
Hog-products	4·3 „	0·53
Poultry and fish	2·8 „	0·34
Bread*	9·7 }	22·8 lbs. 0·56
Flour and Meal	13·1 }	
Cheese	5 ozs.	0·05
Milk	13·6 pints	0·41
Sugar	5·2 lbs.	0·30
Tea and coffee	17 ozs.	0·31
Other food	—	2·50

* Assuming the loaf is about 2 lbs., as the price indicates.

Comparing this with the table given on p. 178, we see that the consumption of meat (beef, mutton and veal) is considerably more than of the English artisan with 30s. or more weekly wage, and more

"hog-products" are consumed in the United States of America. Considerably less bread and flour are used, but a great deal more milk, more coffee and less tea, a little more sugar. On the whole the diets are very similar. For the items included, the cost in the United States of America is \$3.77, in the United Kingdom, 14s. 3^d. An actual comparison of prices would need more detailed study. The food expenditure is a much smaller proportion of the total in the United States of America than here.

It is curious to notice that rent is nearly the same proportion of income at all grades; meanwhile the proportion spent on lighting, fuel and food diminishes, while the actual amount increases; the proportion spent on clothing increases rapidly, and the proportion left for other purposes is much greater at high than at low incomes. This agrees with Engel's laws except for clothing and for fuel; according to him "the percentage of outlay for clothing is approximately the same whatever the income."

Of the whole number of families included, 19 per cent. own their houses, 50 per cent. of these being without encumbrance (p. 52). On p. 43 we find that half of the heads of families are "idle" for some part of the year, and that the average extent of idleness, spread over the whole group (fully employed or not) is 4.7 per cent.; a very important addition to our knowledge.

If the examples were well chosen we have (p. 285) an important table showing the grouping of income in several industries. The grouping for the 24,402 men who gave sufficient information is shown in the last column in the table above. This may be compared with the table quoted in the *Journal of the Royal Statistical Society*, 1904, p. 526.

Part II contains the result of an exhaustive inquiry as to the course of retail prices since 1890. An aggregate of 5,300 statements were obtained from 33 States, relating in all to 30 articles. "The greatest care was taken to secure prices throughout the period for an article of precisely the same kind and grade." The numbers are given in sufficient detail, the table extending over 178 pages, to make it possible to check the precision of the results by the variations of the separate statements from their mean. Several interesting problems in weighting arise, but as the results prove to be independent of the weights (as might be expected from theory) they need not be discussed.

The following table shows the results. The wholesale prices for United States of America are quoted "from Bulletin 51 of the Bureau of Labor," and relate to 53 articles of food. With these may be given our Board of Trade's wholesale index number of food (H.C. 321), and the retail prices for London (Cd-2337, p. 75), arranged to give equality in 1901:—

Index Numbers of Prices of Food.

	United States.		United Kingdom.	
	Retail.	Wholesale.	London. Retail.	General. Wholesale.
1890	102.1	112.4	106.7	113
'91	103.4	115.7	109.2	119
'92	101.8	103.6	109.3	115
'93	104.1	110.2	103.5	115
'94	100.3	99.8	100.4	108
1895	98.2	94.6	95.4	105
'96	95.8	83.8	91.4	98
'97	96.3	87.7	98.0	102
'98	98.5	94.4	104.3	106
'99	99.6	98.3	97.8	103
1900	101.5	104.2	100.4	105
'01	105.5	105.9	105.5	106
'02	110.9	111.3	103.0	108
'03	110.9	107.1	104.7	—

The comparison of these numbers is best made by diagram. It is then at once clear that in the United States of America the retail numbers move year by year (except in 1903) with the wholesale, but change by a much smaller percentage. It appears that greater success has been achieved in Washington than in London in obtaining genuine retail prices; those given by our Board of Trade move very closely with wholesale prices (see table above). The wholesale prices for the two countries show some instructive differences, especially in 1898 and in 1892-94.

The volume is full of important and novel information, and reflects great credit on all concerned in its production. A.L.B.

Protection in France. By H. O. Meredith. vi + 189 pp. crown 8vo. London: P. S. King and Co., 1904.

An account, such as that furnished in this book, of the fiscal practice of a nation which, as our nearest neighbour, seems destined to maintain a large trading connection with this country, whether as purchaser or seller, although as a business-rival it has become subordinate to the United States and Germany, possesses no small interest for English readers; and Mr. Meredith, it is evident, commands the economic knowledge, the statistical ability, and the power of orderly and clear narration which are needed to make such an account both agreeable and informing. French fiscal policy can hardly be at any time a matter of indifference to us, and the commercial treaty negotiated by Cobden with Napoleon, on which Mr. Meredith throws interesting new light, has taken a conspicuous position in the history both of fiscal practice and of fiscal theory. It is now variously regarded by our controversialists as a triumph for Free Trade, and as a proof that the great apostle of Free Trade could on a suitable occasion show his independence of the letter of

the strict articles of the pure Cobdenic creed as it is now sometimes professed. Mr. Meredith himself indeed is a "convinced free-trader," although he is too competent and instructed an economist not to know and to appreciate the modification made by recent economic speculation in older free trade theory. But the main contention of his book is, that, whatever reasons may be urged in theory for what he calls "scientific protectionism," in actual practice what he distinguishes as "Mercantile Protection" gets the upper hand, and accordingly in France, where that, as he tries to show, has happened, Economic Science condemns the existing fiscal system.

We do not feel sure that Mr. Meredith is not imposing too rigorous a test on practical statesmen when he looks in their political speeches for nice distinctions of economic doctrine. It may even be unreasonable to maintain that, because in their ignorance or disregard of the guidance which the instructed seek from abstract reasoning, they are unwarily or even knowingly betrayed into logical pitfalls, they must be unsparingly condemned as blind leaders of the blind, and that the adoption of one or two or more economic fallacies should be treated as leading necessarily to the most extreme and indefensible positions of deluded error. We should hardly admit without reserve the reproach which we suppose to be implied in Mr. Meredith's epithet "Mercantile;" and we certainly entertain more doubt than Mr. Meredith whether pure abstract doctrine at the present moment offers the sure direction amid the shifting quicksands of political movement which he appears to postulate. We are apprehensive lest some of his own reasoning should be "caviare to the general;" and we do find it easy to appreciate the subtlety, which would, if we understand him aright, argue that the agriculture of France could not be directly injured by the unrestricted competition of new countries, unless that competition exercised an influence indirectly by invoking fresh exports of French manufactures to pay for the fresh food imported. This reasoning may be a consequence drawn by Mr. Meredith from the refinements of the English theory of international trade, but it is calculated to bewilder rather than enlighten the plain citizen, and to deter and not attract practical statesmen. In fact, the chief defect of Mr. Meredith's book appears to us to be the lavish introduction into a discussion necessarily popular of the nicer arguments of elaborate theory.

He is, it must be admitted, no unskilful tyro in its use. Both in his handling of these refined complexities and in his treatment of the statistical material presented in his final chapters, he exhibits an uncommon measure of knowledge and acumen. Yet in the latter case this very talent serves to prove how difficult it is, from the imperfect data alone available, to draw comparisons of real instructiveness between Protectionist France and Free Trade England; and the new Fiscal Blue Book issued since Mr. Meredith's volume was prepared emphasises the many formidable obstacles which beset the statistician in this region of inquiry. Mr. Meredith himself often complains of material deficient in quantity and inadequate in quality, although perhaps enough evidence is forth-

coming to establish his conclusion that a "slackening" can be traced in France during recent years in trade, in wages, in working-class consumption, and in general wealth. He thinks that this "slackening" can be causally connected with Protection; but he admits that the connection must be inferred rather than demonstrated. He is on surer ground when he proves by quotation from reported speeches the mixed motives which have influenced the introduction of fiscal changes by such statesmen as M. Méline, and describes the manipulation of the details of the legislation by powerful business interests. Such facts deserve attentive study, and the means are furnished in this little book. We hope that Mr. Meredith may follow his account of fiscal history in France by a further volume upon Italy, for we understand that that country also was originally intended to have been included in the purview of this book. L.L.P.

La Statistique: ses difficultés, ses procédés, ses résultats. Par André Liesse. viii + 178 pp., crown 8vo. Paris: Guillaumin, Alcan, 1905.

This little work is addressed, as the author tells us, not so much to "statisticians by profession" as to the "crowd of extemporised statisticians," in the hope of "rousing their scientific conscience, slumbering under the hypnotic influence of figures." As is almost inevitable under such a limitation, the treatment is a little weak and discursive.

There are only eight chapters in the book. The opening chapter, giving a sketch of the history of the subject, is followed by one on the difficulties of observation in statistics, two on classification, deductions, &c., two "on the study of symptoms," and two on "the regularity and periodicity of economic phenomena." Mathematics of course are almost wholly avoided; the only algebraic formulæ that occur are found in connection with the definitions of means (Chapter IV), and Pareto's law of the distribution of wealth (Chapter VIII). The author does not appear to be aware of the existence of recent work in theory of statistics, which finds no mention at all.

Examples and illustrations are drawn freely from the older writers, but our author's knowledge of the history of statistics would seem to be in some directions limited. "La science des actuaires que l'on nomma, un temps, 'l'arithmétique politique'" (p. 7), sounds curious to an English reader; a reference at least to Sir Wm. Petty might have been expected, if not an explanation that the (continental) limitation of the term to "la science des actuaires" was of later date. It is rather hard on Euler that he should be specially selected for condemnation as a statistical sinner, "lorsque . . . provoqué par Süßmilch, il émettait cette hypothèse que la population de Londres croissait en proportion géométrique" (p. 60). Professor Liesse will find in the "Göttliche Ordnung" itself references to the work of Graunt and Petty, who both used the same hypothesis in the previous century. The statement that "c'est à Quételet que Galton a emprunté la formule des probabilités au moyen de laquelle on exprime la

fréquence des oscillations autour d'une moyenne" (p. 161), is probably correct, but the footnote is a little surprising, "M. O. Ammon, dans *l'ordre social et ses bases naturelles* . . . fait remarquer . . . que cette formule de Quételet avait été trouvée déjà par Gauss." The author himself, as Professor of Statistics, should surely have heard of the work of Gauss, not to mention Laplace. G.U.Y.

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No. 4—L'Immigration et l'Unité Nationale aux États-Unis: *Anatole Leroy Beaulieu.* Le Recrutement Régional de la Magistrature: *Baron Guillebert.* Monographie d'une Commune Rurale.—Vence (Alpes-Maritimes): *Jules Grec.* Le Repos du Dimanche au Conseil Supérieur du Travail: *René Blondan.*

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La Réforme Sociale, 1905—Contd.

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No. 6—Nécrologie. M. Clément Juglar, Membre de l'Institut: *A. Delaire*.

Revue d'Économie Politique—

December, 1904—La Part de l'Allemagne dans le Trafic du Port d'Anvers. La question sociale et l'héritage: *C. R. C. Herckeurath*. Chronique ouvrière: *Charles Rist*.

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Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft (Schmoller's). Heft 1, 1905—Über die Fakultäten, deren Vereinigung und Trennung: *Gustav Cohn*. Zur naturwissenschaftlichen Gesellschaftslehre: *Ferdinand Tönnies*. Glossen zu den bisherigen Volkszählungen im Deutschen Reich. Zweites Stück. 1: *E. Heitz*. Besteuerung und Entwicklung der Industrie-Aktiengesellschaften in Österreich: *Felix Somary*. Die brandenburgisch-preussische Getreidehandelspolitik von 1713-1803: *Wilhelm Naudé*. Zur Organisation des südrussischen Getreide-Exporthandels: *Max Winters*. Die preussische Alaunhüttenindustrie und das Alaunsyndikat von 1836-1844. 1: *Ewald Moll*. Unternehmervverbände in Belgien: *Karl Bräuer*.

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November, 1904—Das Problem der Armut: *Emil Muensterberg*. Sozialwissenschaft, Geschichte, und Naturwissenschaft: *W. E. Biermann*. Das elsass-lothringische Gesetz vom 14. Juli 1903 betr. die Errichtung und den Betrieb von Apotheken:

GERMANY—Contd.

Jahrbücher für Nationalökonomie und Statistik (Conrad's)—Contd.
November, 1904—Contd.

Aug. Hertzog. J. B. Says Methodologie der Wirtschaftswissenschaft: *F. Lifschitz.* Elektrischer Antrieb mit Maximalarbeitstag und Mindestlohn tarif in der Hausweberei: *Robert Willbrandt.* Zur Begriffsbestimmung des "Kaufmanns," "Fabrikanten," und "Handwerkers": *Bernhard Harms.* Zum Kapitel der Haushaltskosten: *A. Emminghaus.* Das Einlogierewesen in Deutschen Städten: *W. Kalkstein.*

December, 1904—Das statistische Amt für das Grossherzogtum Oldenburg in den ersten fünfzig Jahren seines Bestehens: *Paul Kollmann.* Die wirtschaftliche Gesetzgebung Oesterreich-Ungarns im Jahre 1903: *Albert Hesse.* Landarbeiter-Fürsorge in Dänemark: *Heinrich Pudor.* Die Kriminalität und die arbeitenden Volksklassen in Oesterreich: *Hugo Herz.* Statistische Mitteilungen über die Landwirtschaft in Bayern: *Carl Steinbrück.* Zur Begriffsbestimmung des "Kaufmanns," "Fabrikanten," und "Handwerkers": *G. Lastig.*

February, 1905—Die Entwicklungsgeschichte einer amerikanischen Industrie. Studien über den Einfluss der Zolltarife und Trusts auf die Weissblechindustrie der Vereinigten Staaten: *Hermann Levy.* Mitteilungen über das Eisenbahnwesen in den Vereinigten Staaten von Amerika: *Blum.* Ein Dreimarkstück: *Wilhelm Horn.* Das Statistische Amt des Department of Agriculture der Vereinigten Staaten von Nordamerika: *F. W. R. Zimmermann.* Die Arbeitslosenfürsorge der deutschen Arbeiterberufsvereine: *Moritz Wagner.* Die Aenderungen des Krankenversicherungsgesetzes: *Fuld.* Die staatswissenschaftliche Fortbildung der Juristen: *Georg Brodnitz.*

Zeitschrift für Versicherungs-Wissenschaft. Heft 1, 1905—Das Problem der Mutterschaftsversicherung: *Else Lüders.* Krankenkassen und Ärzte: *Paul Moldenhauer.* Die Wirkung der Auslese auf die Sterblichkeit in den ersten Versicherungsjahren: *Georg Engelbrecht.* Über den Verlauf von Unfällen Versicherter: *Josef Samson.*

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Heft 12, 1904—Feminismus und Rasse: *S. R. Steinmetz.* Zwei Jahre Fürsorgeerziehung: *F. Schiller.* Zur Würdigung der historischen Schule der Nationalökonomie VIII: *Georg Below.*

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Heft 2, 1905—Gegenwart und Zukunft der Baumwolle I: *A. Oppel.* Lassalle-Studien: *Th. G. Masaryk.* Der Kampf um den Strafvollzug: *Max Treu.* Die finanzielle Kriegführung Russlands. I.: *Valentin Wittschewsky.*

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Vierteljahrshefte zur Statistik des Deutschen Reichs. Heft 4, 1904—
 Konkurs-Statistik, 1903. Zur deutschen Justizstatistik, 1903.
 Die Schulbildung der Rekruten, 1903. Die Bergwerke, Salinen,
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 -handel, 1903-04. Zuckergewinnung und -besteuerung, 1903-04.
Zeitschrift des K. Preuss. Statistischen Bureaus, Abteilung 3, 1904—
 Die preussischen Sparkassen im Rechnungsjahre 1902: *C. Ballod*.
 Zur Frage der Gemeindebesteuerung in Preussen. Die rück-
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 Verbrechen und Vergehen in Preussen im Jahre: *F. Kahuert*.

ITALY—

Giornale degli Economisti—

December, 1904—Osservazioni pratiche sul materiale statistico:
A. Bertolini. Capitali sottratti all' Italia dall' emigrazione
 per l' estero: *A. Beneduce*. Il panificio municipale di
 Cantania: *P. Cicero*. Russia e Giappone: *G. François*. La
 ferrovia gratuita: *T. Molinari*. La popolazione dello Stato
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January, 1905—La Misurabilità del piacere e del dolore:
U. Ricci. I succhioni della marina mercantile: *E. Giretti*.
 Il panificio Municipale di Cantania: *P. Cicero*. L' Espansione
 economica e coloniale del Giappone: *M. Fanno*.

February, 1905—La Dottrina della colonizzazione sistematica di
E. G. Wakefield: *R. Dalla Volta*. A proposito di un Istituto
 internazionale permanente di Agricoltura: *M. Pantaloni*.
 Breve nota sull' evoluzione della famiglia operaia nel
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December, 1904—L' odierno movimento democratico cristiano in
 Italia: *A. Cantono*. Lo statuto agrario sammarinese: *G.*
Carabinieri. Le terze classi in tutti i diretti: *A. Fazio*. Il
 bilancio finanziario della Prussia: *Federico Flora*. Contribu-
 zione alla storia e statistica dei salari industriali in Italia
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 Sui rapporti fra protezionismo e trust: *C. Jarach*. Le ultime
 elezioni politiche italiane: *A. Schiari*. Nota di contabilità
 di Stato: *V. Vianello*.

January, 1905—Gli iscritti nelle Università e negli istituti
 superiori Italiani nell' undicennio scholastico dall 1893-94 al
 1903-04: *Carlo F. Ferraris*. Lo sciopero dei zolfatari di
 Caltanissetta e l' Organizzazione Lavoratrice nelle zolfare
 siciliane: *F. Gallina*. Il disordine della nostra contabilità di
 stato: *V. d'A.* La Crisi agrumaria in Sicilia: *E. Arduino*.
 I risultati della Riforma del regime Tributario delle Bevande
 e degli zuccheri in Francia: *Gaston Bér.* Gli ultimi risultati
 della nazionalizzazione delle ferrovie nella Svizzera: *P.*
Charton. L' Introduzione della "Linotype" nelle Tipografie
 Americane e la sua influenza sui salari e sulle leghe operaie:
George E. Burnett.

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La Riforma Sociale—Contd.

February, 1905—Prime Linee di una Teoria matematica dello Smercio: *Maurro Amoroso*. La Situazione Politica in Francia: *Pierre Bernoud*. Le ultime elezioni politiche Italiane: *Alessandro Schiari*. Il mercato finanziario nel 1900: *Arthur Raffalovich*.

ROUMANIA—

Le Mouvement Économique—

December, 1904—Le placement des capitaux étrangers en Roumanie: *Nicolas Xénopol*. La politique économique de la Roumanie en Orient: *L. Colescu*. La houille blanche en Roumanie: *P. Michel*. Le crime de fausse monnaie: *G. Danielopol*. Le budget de la Bulgarie pour 1904. Le chemin de fer de Bagdad.

January, 1905—La crise immobilière à Bucarest: *Nicolas Xénopol*. La condition juridique des sociétés étrangères en Roumanie: *Démètre Negulesco*. La Politique agraire en Roumanie: *Démètre Comsa*. Les associations agricoles et ouvrières en Bulgarie: *Stanislas Cihoski*. Les mines de l'île de Thassos. Le bassin houillier d'Heraclée.

March, 1905—Le Traité de Commerce roumano-allemand: *Nicolas Xénopol*. Les Intérêts allemands en Roumanie: *Léo Muffelmann*. Le Mouvement commercial du Port de Constantza: *G. Christodoresco*.

SWITZERLAND—

Journal de Statistique Suisse. Lief. 1—Beitrag zur Krankenversicherung: *A. Bohren*. Der Kredit-Verein in Basel vom Jahre 1848: *W. Speiser*. Exposé préliminaire du résultat de l'examen sanitaire des enfants arrivés, en 1903, à l'âge de scolarité. Das Vieh Graubündens und seine Beziehung zur brachycephalen Urrasse: *Johannes Brügger*. Über Dauererfolge bei Sanatoriumsbehandlung und den Wert von Volksheilstätten: *Frit. Walther*. Fréquence et répartition du sarcôme en Suisse de 1892 à 1901: *Rodolphe de Merreilleux*.

VII.—Quarterly List of Additions to the Library.

Additions to the Library during the Quarter ended 15th March, 1905, arranged alphabetically under the following heads:—(a) Foreign Countries; (b) India and Colonial Possessions; (c) United Kingdom and its Divisions; (d) Authors, &c.; (e) Societies, &c. (British); (f) Periodicals, &c. (British).

The Society has received, during the past quarter, the current numbers—either quarterly, monthly, or weekly—of the periodical official publications dealing with the following subjects:—

Consular Reports—From United States and United Kingdom.

Labour Reports, &c.—From Austria-Hungary, Belgium, France, Germany, Italy, United States, New York State, Canada, New Zealand, and United Kingdom.

Trade Returns—From Argentina, Austria-Hungary, Belgium, Bulgaria, China, Denmark, Egypt, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Roumania, Russia, Spain, Sweden, Switzerland, United States, India, Canada, and United Kingdom.

Vital Statistics—From Argentina, Egypt, Germany, Italy, Netherlands Roumania, Switzerland, United States (Connecticut and Michigan only), Queensland, South Australia, and United Kingdom.

Vital Statistics of following Towns—Buenos Ayres, Buda-Pesth, Brünn, Prague, Brussels, Copenhagen, Berlin, Bucharest, Moscow, Madrid, London, Manchester, Dublin, Edinburgh, and Aberdeen.

The Society has received during the past quarter the current numbers of the following unofficial Periodicals and Publications of Societies, &c., which are arranged under the Countries in which they are issued:—

Denmark—Nationalökonomisk Tidsskrift.

France—Annales des Sciences Politiques. Économiste Français. Journal des Économistes. Monde Économique. Polybiblion, Parties Littéraire et Technique. Réforme Sociale. Le Rentier. Revue d'Économie Politique. Revue de Statistique. Journal de la Société de Statistique de Paris.

Germany—Allgemeines Statistisches Archiv. Archiv für Sozialwissenschaft und Sozialpolitik. Deutsche Oekonomist. Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirtschaft. Jahrbücher für Nationalökonomie und Statistik. Zeitschrift für die gesamte Staatswissenschaft. Zeitschrift für die gesamte Versicherungs-Wissenschaft. Zeitschrift für Sozialwissenschaft. Mittheilungen aus der Handelskammer Frankfurt a. M.

Italy—L'Economista. Giornale degli Economisti. Rivista Italiana di Sociologia. Riforma Sociale. Società Umanitaria, Bollettino mensile.

Sweden—Ekonomisk Tidskrift.

Switzerland—Journal de Statistique suisse.

United States—American Journal of Sociology. Banker's Magazine. Bradstreet's. Commercial and Financial Chronicle, with supplements. Journal of Political Economy. Political Science Quarterly. Quarterly Journal of Economics. Yale Review. American Academy of Political and Social Science, Annals. American Economic Association, Publications. American Geographical Society, Bulletin. American Statistical Association, Quarterly Publications. American Philosophical Society, Proceedings and Transactions. Columbia University, Studies in History, &c.

India—Indian Engineering. Asiatic Society of Bengal, Journal and Proceedings.

Canada—The Chronicle: Insurance and Finance.

New Zealand—Government Insurance Recorder. Trade Review and Price Current.

United Kingdom—The Accountant. Accountants' Magazine. Athenæum. Australian Trading World. Bankers' Magazine. Broomhalls' Corn Trade News. Browne's Export List. Colliery Guardian. Commercial World. Economic Journal. Economic Review. Economist. Fireman. Incorporated Accountants' Journal. Insurance Record. Investors' Monthly Manual. Investors' Review. Joint Stock Companies' Journal. Labour Co-partnership. Licensing World. Local Government Journal. Machinery Market. The Market. Nature. Navy League, Journal. Policy-Holder. Post Magazine. Produce Markets' Review. Public Health. Publishers' Circular. Sanitary Record. Shipping World. South American Review. Statist. The Times. Tuberculosis. Anthropological Institute, Journal. Cobden Club, Leaflets. East India Association, Journal. Howard Association, Leaflets, &c. Institute of Actuaries, Journal. Institute of Bankers, Journal. Institution of Civil Engineers, Minutes of Proceedings. Iron and Steel Institute, Journal. Lloyd's Register of British and Foreign Shipping, Statistical Tables. London Chamber of Commerce, Journal. London University Gazette. Manchester Literary and Philosophical Society, Memoirs and Proceedings. Royal Agricultural Society, Journal. Royal Asiatic Society, Journal. Royal Colonial Institute, Proceedings and Journal. Royal Geographical Society, Geographical Journal. Royal Irish Academy, Proceedings and Transactions. Royal Meteorological Society, Meteorological Record and Quarterly Journal. Royal Society, Proceedings. Royal United Service Institution, Journal. Sanitary Institute, Journal. Society of Arts, Journal. Statistical and Social Inquiry Society of Ireland, Journal. Surveyors' Institution, Professional Notes and Transactions. Trade Circulars.

(a) Foreign Countries.

Argentine Republic—

Agricultura. Ministerio de. Boletín mensual de Estadística y Comercio. (Current numbers).....	The Ministry of Agriculture
Plano indicativo de las Tarifas por el transporte del Trigo, Lino & Maíz en las principales líneas de Ferro Carriles. Map, folded sheet. 1905.....	
Buenos Ayres (Province). Direccion General de Estadística. Boletín mensual. (Current numbers).....	The Provincial Statistical Bureau
Santa-Fé. Boletín de Estadística municipal. Año 3. No. 12, 1904. Fol. 1904.....	The Statistical Bureau

Austria-Hungary—

Ackerbauministeriums. Statistisches Jahrbuch für 1903. Heft 2, Der Bergwerksbetrieb Österreichs im Jahre 1903. Lief. 2, Bergwerksverhältnisse (mit Ausnahme der Bergwerksproduktion und Lohnstatistik). Naphthastatistik. Schlagwetterstatistik. 8vo. 1904.....	The Ministry of Agriculture
Arbeitseinstellungen und Aussperrungen in Österreich, während des Jahres 1903. 8vo. 1904.....	
Arbeitsstatistisches Amt. Protokoll der 18ten Sitzung des Arbeitsbeirates am 5. Nov., 1904. 8vo. 1904...	The Central Statistical Commission
Betriebszählung vom 3. Juni, 1902. Vorläufige Ergebnisse der Gewerblichen. 8vo. 1904.....	The Austrian Labour Department
Bewegung der Bevölkerung im Jahre 1901. Fol. 1904.....	
Eisenbahnstatistik für 1903. Österreichische, Teil 1, Hauptbahnen und Lokalbahnen. Teil 2, Kleinbahnen. La fol. 1904.....	The Central Statistical Commission
	The Ministry of Railways

(a) **Foreign Countries—Contd.****Austria-Hungary—Contd.**

Mitteilungen des k.k. Finanz-Ministeriums. Jahrgang 10. Heft 3. 8vo. 1904	The Ministry of Finance
Österreichisches Wirtschaftspolitisches Archiv (vormals "Austria"). (Current numbers.) 8vo.	
Post- und Telegraphwesens im Jahre 1903. Statistik des österr. 8vo. 1904	The Ministry of Commerce
Rechtspflege im Jahre 1900 und 1901. Hefte 2 und 3. Fol. 1904	
Rechtspflege. Stat. Übersicht der Verhältnisse der Österr. Strafanstalten und der Gerichts-Gefängnisse in 1900 und 1901. Fol. 1904	The Central Statistical Commission
Statistische Monatschrift. (Current numbers)	
Statistische Nachrichten aus dem Gesamtgebiete der Landwirtschaft. (Current numbers)	The Central Statistical Bureau
<i>Hungary.</i> Annuaire Statistique Hongrois. Nouveau Cours. xi. 1903. 8vo. 1904	
<i>Budapest.</i> Monatshefte des Budapester Communal-Statistischen Bureaus. (Current numbers)	The Municipal Statistical Bureau

Belgium—

Armée Belge. Statistique Médicale. Année 1903. 8vo. 1904	The Belgian Government
Belgium; its Institutions, Industries and Commerce. General Notes collected and published under the direction of the General Commissariat of Belgium for the Louisiana Purchase Exposition. 8vo. 1904	
Commerce. Tableau général du Commerce avec les Pays Etrangers pendant 1903. La fol. 1904	Bureau of General Statistics
Mines. Annales des Mines de Belgique. Année 1904. Tome 9, Livr. 4. Année 1905. Tome 10, Livr. 1. 8vo. 1904-05	
Travail. Rapports annuels de l'Inspection du Travail. 9 ^{me} année, 1903. 8vo. 1904	The Belgian Labour Department
Travail. Salaires dans l'Industrie Gantoise. 2, Industrie de la Filature du Lin. Rapport et Enquête. 8vo. 1904	
Travail. Rapport relatif à l'exécution de la loi du 31 Mars, 1898, sur les Unions professionnelles pendant 1898-1901. 8vo. 1904	The Municipal Health Department
<i>Brussels.</i> Rapport annuel. Demographie, Hygiène, Salubrité publique. Statistique médicale. Année 1903. 8vo. 1904	
<i>Bruges.</i> Verslag over het bestuur en den toestand van stadszaken, Jaar 1903. 8vo. 1904	The Bureau of General Statistics
<i>Académie Royale de Belgique—</i> Annuaire pour 1905. Portraits, 8vo. 1905	
Bulletin de la classe des lettres. . . 1905. (Current numbers)	The Academy
<i>Institut de Sociologie—</i> Le Charbon dans le nord de la Belgique. Les points de vue technique: <i>G. de Leener.</i> Juridique: <i>L. Wodon.</i> Economique et sociale: <i>E. Waxweiler.</i> Map, 8vo. 1904	
Principes d'Orientation Sociale. Résumé des études de M. Ernest Solvay sur le Productivisme et le Comptabilisme. 2 ^e édit. 8vo. 1904	Mr. E. Waxweiler
Le Procès du Libre-Échange en Angleterre, avec un Appendice sur la Bibliographie de la question douanière en Angleterre, par D. Warnotte: <i>D. Crick.</i> 8vo. 1904	

(a) Foreign Countries—*Contd.***Belgium—*Contd.****Institut de Sociologie—Contd.*

Que faut-il faire de nos Industries à domicile :	} Mr. E. Waxweiler
<i>M. Ansiaux.</i> 8vo. 1904	
Syndicats Industriels en Belgique : <i>Georges de Leener.</i> 2nd Edit. 8vo. 1904	

Chile—

Demografia Chilena. Rectificaciones à las publicaciones oficiales. 8vo. 1904	} The Statistical Bureau
Estadística Comercial de la Republica, año de 1903. Fol. 1904	
Estadística Criminal correspondiente al año de 1903. La. fol. 1904	} The Registrar-General for England

China—

Customs Gazette. (Current numbers)	} Sir Robert Hart, Bart., G.C.M.G.
Trade. Returns of Trade and Trade Reports for 1903. Part 2. Reports and Statistics for each Port, with Report on Foreign Trade of China, and Index to Annual Trade Reports, 1898-1902. 4to. 1904	

Denmark—

Annuaire statistique. 9 ^{me} année. 1904. 8vo. 1904	} The State Statistical Bureau
Causes des décès dans les villes du royaume de Danemark, 1903. 4to. 1904	
Importation et Exportation du Danemark en 1903. 4to. 1904	
Population du Royaume, le 1 ^{er} Février, 1901. 2 ^e Partie. 4to. 1904	
[Birthplaces and migration and occupations of the people.]	

Egypt—

Comité de Conservation des Monuments de l'Art arabe. Exercice 1903. Fasc. 20. Rapports, &c. Plates, 8vo. 1903	} The Committee

France—

Annuaire Statistique. 23 ^e Volume, 1903. 8vo. 1904 [This issue contains several additional tables dealing with Population, Justice, Industries, and Banks for single years, and retrospective tables regarding, among other subjects, height of conscripts, health of navy, infant mortality, and some tables of international statistics.]	} The French Labour Department
Agriculture. Ministère de l'. Bulletin mensuel de l'Office de Renseignements agricoles. (Current numbers.) 8vo.	
Chemins de fer français. Statistique des, au 31 Décembre, 1902. Documents divers. 1 ^{re} Partie, Intérêt général. 4to. 1904	} The Ministry of Public Works
Chemins de fer de l'Europe. Situation au 1 ^{er} Janvier, 1904. Ouvertures en 1903. 4to. 1905	
Commerce et Navigation. Tableau général du, année 1903. Vol. i. La. fol. 1904	} The French Government
Enseignement primaire. Statistique de l'. Tome vii, (1901-02). 4to. 1904	
Finances. Ministère des. Bulletin de Statistique et de Législation comparée. (Current monthly numbers)	} The Ministry of Finance
Justice Criminelle. Compte Général de l'administration de la, pendant 1902. 4to. 1904	

(a) **Foreign Countries—Contd.****France—Contd.**

Minerale. Statistique de l'Industrie, et des appareils à vapeur en France et en Algérie pour 1903. 4to. 1905	The Ministry of Public Works
Navigation Intérieure. Statistique de la, Relevé général du Tonnage des Marchandises. Année 1903. 4to. 1904	
Banque de France. Assemblée Générale des Actionnaires du 26 Janvier, 1905. Compte Rendu au nom du Conseil Général de la Banque et Rapport de MM. les Censeurs. 4to. 1905	The Bank of France
Seine. Département de la. L'assistance des Aliénés en France, Allemagne, Italie et en Suisse par le Dr. Paul Serieux. 4to. 1903	
Paris. Annuaire Statistique de la Ville de Paris. 23 ^e année, 1902. La. Svo. 1904	The Municipal Statistical Bureau

Germany—

Binnen-Schiffahrt im Jahre 1903. Diagrams, 4to. 1904	The Imperial Statistical Bureau
Gesundheitsamtes. Veröffentlichungen des Kaiserlichen. (Current numbers)	
Handel. Auswärtiger Handel des deutschen Zollgebiets im Jahre 1903. Teil 2. Darstellung nach Warengattungen. 4to. 1904	The Imperial Health Bureau
Krankenversicherung im Jahre 1902. 4to. 1904	
Seeschiffahrt. Die deutsche Flagge in den ausserdeutschen Häfen. Erster Teil. Europäische Häfen. Fol. 1904	The Imperial Statistical Bureau
Seeschiffahrt im Jahre 1903. Teil 1. Bestand der deutschen Seeschiffe (Kaufahrteischiffe). 4to. 1904	
Unfallversicherung. Statistik der, Unfallstatistik für Land- und Forstwirtschaft, 1901. Teil 2. Small 4to. 1904	The Imperial Insurance Bureau
Unfallversicherung und Invalidenversicherung für 1903 (contained in). Amtliche Nachrichten des Reichs-Versicherungsamts. Nr. 1. Jan., 1905. Small 4to. 1905	
Vierteljahrshefte zur Statistik des Deutschen Reichs. Jahrgang 1904. Heft 4. 4to.	The Imperial Statistical Bureau
Statistisches Jahrbuch Deutscher Städte. Jahrgang 12. Svo. 1904	
Prussia. Zeitschrift des K. Preussischen Statistischen Bureaus. (Current numbers)	Purchased
Saxony. Zeitschrift des K. Sächsischen Statistischen Bureaus. (Current numbers)	
Berlin. Berliner Statistik, Heft 3. Lohnermittelungen und Haushaltrechnungen der minder bemittelten Bevölkerung in 1903. 4to. 1904	The Royal Prussian Statistical Bureau
Breslau. Breslauer Statistik. Band 24, Heft 2. Jahresberichte Städtischer Verwaltungen für 1903. Heft 3. Bevölkerungswechsel. Erkrankungen. Preise für Nahrungsmittel, etc., en 1903. Svo. 1905	
Hamburg. Statistik des Hamburgischen Staates. Heft 22. 4to. 1904	The Statistical Bureau of Saxony
Almanach de Gotha, 1905. Portraits, Svo.	
Veröffentlichungen des Deutschen Vereins für Versicherungs-Wissenschaft. Heft 4. Statistische und mathematische Abhandlungen zur Versicherungs-Wissenschaft. Svo. 1905	The Municipal Statistical Bureau
	The Society

(a) Foreign Countries—*Contd.***Italy—**

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Ashley (W. J.). Progress of the German Working Classes in the last quarter of a century. Svo. 1904	
Atkinson (Edward). Facts and Figures. The basis of Economic Science. Svo. 1904	Messrs. Longmans
[Contains a True Policy of Protection; The Tendency to Individualism rather than to Collectivism in Manufacturing and Arts; Address to American Free Trade League on the Hundredth Anniversary of Richard Cobden's Birth; The Cost of War and Warfare.]	
Booth (Charles). Life and Labour of the People in London. Second Series: Industry. Vols. 1—5. Svo. 1903	"
Caillard (Sir Vincent H. P.). Imperial Fiscal Reform. Svo. 1903	
Chapman (Sydney J.). The Lancashire Cotton Industry. A Study in Economic Development. Svo. 1904	Purchased
(Another copy presented by the Publishers.)	
Clarke (Sir Ernest). Bury Chroniclers of the Thirteenth Century. 26 pp., Svo. 1905	The Author

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<i>Cook-Watson (Ralph)</i> . Life Assurance Premiums charged by various Companies, arranged in the order of magnitude. 18 pp., 8vo. 1905	The Author
<i>Cunninghame (H.)</i> . A Geometrical Political Economy, being an Elementary Treatise on the Method of explaining some of the Theories of pure Economic Science by means of diagrams. 8vo. 1904	
<i>Dawson (William Harbutt)</i> . Protection in Germany. A History of German Fiscal Policy during the Nineteenth Century. 8vo. 1904	Purchased
<i>De la Plaza (F.)</i> . Exposicion del Doctor Victorino De la Plaza sobre Tratados de Comercio. 35 pp., 8vo. 1905	
<i>Ellison (Thomas R.)</i> . Ellison's Annual Review of Cotton Trade for 1904. 4to. 1905	Mr. T. R. Ellison
<i>Ferraris (Carlo F.)</i> . L'amministrazione locale inglese nel suo ordinamento generale. 49 pp., 8vo. 1904	The Author
<i>Figgis, S., and Co.'s</i> Annual Review of India-rubber Market, 1904. Sheet. 1905	The Firm
<i>Flügel (Felix)</i> . Flügel—Schmidt—Tanger. Dictionary of the English and German Languages for Home and School. 2 vols. La. 8vo. 1901-03	Purchased
<i>Fontell (A. G.)</i> . Undersökning rörande Tiensgöringstiden för Jernvägspersonalen vid Helsingfors-Hyvinge och Tammerfors-Bjötneborgs Bandelar. 8vo. 1903	Major Craigie
<i>Ford (Guy Stanton)</i> . Hanover and Prussia, 1793-1803. A Study in Neutrality. 8vo. 1903	The Columbia University Library
<i>Fornasari di Verce (E.)</i> . Eight Pamphlets on various economic subjects by the author. 8vo. 1901-04	
<i>Galwey (C. E.)</i> . Weights and Measures. 20 pp. 8vo. 1904	"
<i>Haggard (Frederick T.)</i> .— Trade as it is, compared with Trade as it was. Leaflet. 4to. 1904	"
No. 50. Freight earned by English Shipping, and Interest earned by Foreign Investments. Leaflet. 1905	
No. 51. Memorandum as to our Foreign Investments. Leaflet. 1905	The Firm
<i>Hayward (T. E.)</i> . An improved method of constructing shortened Life Tables for public health comparative statistics. 20 pp. 8vo. 1905	
<i>Helmut, Schwartze and Co.</i> Annual Report on Wool for 1904. Fol. 1904	Purchased
<i>Hobson (John A.)</i> . International Trade. An application of Economic Theory. Sm. 8vo. 1904	
<i>Jaffé (Edgar)</i> . Das englische Bankwesen. 8vo. 1905	Messrs. Duncker and Humblot
<i>Jones (Thomas Jesse)</i> . Sociology of a New York City Block. 8vo. 1904	The Columbia University Library
<i>Kemp (John)</i> . Periods of Commercial Depression. 7 pp. 8vo. 1905	
<i>Lawson (W. R.)</i> . British Economies in 1904. 8vo. 1904	"
<i>Lerasseur (E.)</i> . Géographie et Statistique. Extrait de l'Annuaire du Bureau des Longitudes, 1905. 176 pp. 12mo. 1905	"
<i>Licht (Otto)</i> . Wöchentliche Zucker-Berichte und Statistik. Fol. 1904. (Current numbers)	Herr Otto Licht
<i>Liéssé (André)</i> . La Statistique; ses difficultés, ses procédés, ses résultats. Sm. 8vo. 1905	Messrs. Guillaumin and Co.

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<i>List (Friedrich)</i> . National System of Political Economy. Translated by Sampson S. Lloyd. New Edition, with introduction by J. Shield Nicholson. 8vo. 1904	The Tariff Reform League
<i>Luckey (G. W. A.)</i> . Professional Training of Secondary Teachers in United States. 8vo. 1903	
<i>Maclean and Henderson (Messrs.)</i> . Review of Insurance Share Market in 1904. Fol. Sheet	The Columbia University Library
<i>Mandello (J.)</i> . Bibliographia Economica Universalis. 3 ^e année, No. 1, Avril, 1904. 8vo. 1904	The Firm
<i>Manes (Alfred)</i> . Versicherungswesen. 8vo. 1905	The Institut International de Bibliographie
<i>Matheson (Robert E.)</i> . The Principal Results of the Census of the United Kingdom in 1901. 24 pp., 8vo. 1905	Mr. B. G. Teubner
<i>Mayr (Georg von)</i> . Der mitteleuropäische Wirtschaftsverein. 16 pp., 8vo. 1904	The Author
<i>Meredith (H. O.)</i> . Protection in France. 8vo. 1904	"
<i>Nicholson (J. S.)</i> . History of the English Corn Laws. 8vo. 1904	Purchased
<i>Pixley and Abell (Messrs.)</i> . Annual Circular for 1904. Sheet. 1904	"
<i>Porter (Hon. Robert P.)</i> . London Electric Railways. (In "Journal of Society of Arts" for 27th Jan., 1905.) 8vo.	The Firm
<i>Price (L. L.)</i> . Recent History of Industrial Peace. 24 pp., 8vo. 1905	The Author
<i>Rozenraad (C.)</i> .— Table comparing the <i>Gold and Silver Stock</i> of the principal <i>Banks of Issue</i> , their <i>Bank Rate</i> , &c., at end of 1903 and 1904. Sheet	The Author
Table comparing Imports and Exports of certain countries during 1904. Sheet	
<i>Scott (W. R.)</i> . The Records of a Scottish Cloth Manufactory at New Mills, Haddingtonshire, 1681-1703. Edited from the Original Manuscripts, with Introduction and Notes, by. (Vol. xlvii of the Publications of the Scottish History Society.) 8vo. 1905	The Compiler
<i>Sensini (Guido)</i> . Le Variazioni dello Stato Economico d' Italia nell' ultimo trentennio del secolo XIX. Saggio di semiologia economica. 8vo. 1904	Messrs. T. and A. Constable
<i>Seyd (Richard E.)</i> . Statistics of Failures in the United Kingdom during the year 1904. Sheet. Fol.	Messrs. Loescher and Co.
<i>Smith (Adam)</i> . An Inquiry into the Nature and Causes of the Wealth of Nations. Edited, with an Introduction, Notes, Marginal Summary, and an Enlarged Index, by Edwin Cannan. 2 vols. 8vo. 1904	The Compiler
<i>Fattersall (William)</i> . Cotton Trade Circular for 1904. 4to. 1905	Purchased
<i>Thomas (David Y.)</i> . History of Military Government in newly acquired Territory of United States. 8vo. 1904	The Author
<i>Thomas (Owen)</i> . Agricultural and Pastoral Prospects of South Africa. 8vo. 1904	The Columbia University Library
<i>Todd (Edwin Smith)</i> . Sociological Study of Clark County, Ohio. 8vo. 1904	The Author
<i>Fyler (Edgar A.)</i> . Insurance Companies' Accounts. 8vo. 1905	The Columbia University Library
<i>Virian Younger and Bond (Messrs.)</i> . Metal Price Current. Prices in London on 1st of month of 1885-1904. Sheet folded. 1905	The Author
<i>Waddel, W., and Co.'s</i> Review of the Frozen Meat Trade, 1904, with supplements. Sheets. 1904	The Firm
	"

(d) **Authors, &c.—Contd.**

<i>Welton (Thomas A.). Bye-Products of the Census:</i>	The Author
A Study of the Recent Migrations of English People, and some other Questions arising in relation to the	
Census, 1901. 39 pp. 8vo. 1904.....	

(e) **Societies, &c. (British).**

Cobden Club. "The Lessons of History on Free Trade and Protection," by Sir Spencer Walpole, K.C.B.	The Club
21 pp. 8vo. 1905.....	
Howard Association Report. October, 1904. 8vo. 1904....	The Association
Institute of Bankers. List of Members. 8vo. 1905	The Institute
Institution of Civil Engineers. Minutes of Proceed- ings. Vol. 158. 8vo. 1904	The Institution
Iron and Steel Institute. Journal. No. 2, 1904. 8vo. 1905	
Liverpool Literary and Philosophical Society. Pro- ceedings. No. 57. 8vo. 1904	The Society
Peabody Donation Fund. 40th Annual Report of the Governors for 1904. Fol. 1905	The Secretary
Royal Agricultural Society of England. Journal. Vol. 65. 8vo. 1904	The Society
Royal Statistical Society. Journal. Parts 2 and 4, 1890; Parts 1 and 4 for 1891, 1892, and 1893. 8vo.	Mr. W. P. B. Shep- heard
Scottish Chartered Accountants. Official Directory, 1904-05. 8vo. 1904	
Society of Comparative Legislation. Journal. New Series. Vol. vi, Part i. 1904. (No. 13)	The Society
Sociological Society. Sociological Papers by Francis Galton, E. Westermarck, P. Geddes, E. Durkheim, Harold H. Mann, and V. V. Branford. With Intro- ductory Address by James Bryce, President of the Society. 8vo. 1905	
Statistical and Social Inquiry Society of Ireland. Journal. 57th Session. Vol. xi, Part 84. Nov., 1904. 8vo. 1904	"

(f) **Periodicals, &c. (British).**

<i>Biometrika.</i> Vol. iii, Part 4, Nov. La 8vo. 1904.....	Purchased
Brewers' Almanack for 1905. 8vo. 1905	Mr. Percy C. Morgan
"Daily Mail" Year Book for 1905. 5th year of issue. 8vo. 1905	The Amalgamated Press, Ltd.
Electrical Engineers' Central Station Directory for 1905. 8vo. 1905	
Licensed Victuallers' Official Annual. 12th Year of Issue for 1905. 8vo. 1904	Mr. A. B. Deane
Newspaper Press Directory for 1905	Messrs. C. Mitchell and Co.
Banking Almanac for 1905	
British Almanac for 1905	Purchased
Burdett's Hospitals and Charities, 1905	
Colonial Office List for 1905	
County Councils . . . Companion for 1905	
Foreign Office List for 1905	
Hazell's Annual for 1905	
Municipal Year Book for 1904	
"Shipping World" Year Book for 1905	
Whitaker's Almanack for 1905	
Who's Who for 1905	
Willings' Press Guide for 1905	

VIII—PERIODICAL RETURNS.

REGISTRATION OF THE UNITED KINGDOM.

No. I.—ENGLAND AND WALES.

MARRIAGES—To 30TH SEPTEMBER, 1904.

BIRTHS AND DEATHS—To 31ST DECEMBER, 1904.

A.—*Serial Table of MARRIAGES, BIRTHS, and DEATHS, returned in the Years 1904-1898, and in the QUARTERS of those Years.*

Calendar YEARS, 1904-1898:—Numbers.

Years	1904.	'03.	'02.	'01.	'00.	1899.	'98.
Marriages No.	—	260,710	261,750	259,400	257,480	262,334	255,379
Births	944,703	917,949	940,509	929,807	927,062	928,646	923,165
Deaths	549,393	514,450	535,538	551,585	587,830	581,799	552,141

QUARTERS of each Calendar Year, 1904-1898.

(I.) MARRIAGES:—*Numbers.*

<i>Qrs. ended last day of</i>	1904.	'03.	'02.	'01.	'00.	1899.	'98.
March..... No.	44,914	45,497	54,056	43,862	43,917	44,512	45,143
June	71,430	72,964	62,463	72,173	71,518	72,389	70,108
September ..	71,215	71,892	71,511	72,201	69,772	72,016	66,497
December ..	—	70,357	73,720	71,164	72,273	73,417	73,631

(II.) BIRTHS:—*Numbers.*

<i>Qrs. ended last day of</i>	1904.	'03.	'02.	'01.	'00.	1899.	'98.
March..... No.	240,117	235,165	231,169	231,161	239,987	231,147	231,680
June	238,891	241,652	237,522	233,548	234,644	239,409	232,449
September ..	237,282	241,125	241,488	235,580	232,579	231,829	235,088
December ..	228,413	230,007	230,330	229,518	219,852	226,261	223,948

(III.) DEATHS:—*Numbers.*

<i>Qrs. ended last day of</i>	1904.	'03.	'02.	'01.	'00.	1899.	'98.
March..... No.	153,255	138,275	150,554	146,137	181,290	147,356	150,705
June	124,222	123,594	132,518	128,570	141,563	131,749	127,149
September ..	133,511	116,607	115,410	139,615	133,074	153,719	141,712
December ..	138,405	135,974	137,056	137,263	131,903	148,975	132,575

*Annual Rates of MARRIAGES, BIRTHS, and DEATHS, per 1,000 PERSONS
LIVING in the Years 1904-1898, and in the QUARTERS of those Years.*

Calendar YEARS, 1904-1898:—General Ratios.

YEARS.....	1904.	Mean '94-1903.	1903.	'02	'01.	'00.	1899.	'98.
Estmtd. Popln. of England and Wales in thousands in middle of each Year.....	33,763,	—	33,378,	32,998,	32,621,	32,249,	31,881,	31,518,
Persons Mar- ried	—	15·8	15·6	15·9	15·9	16·0	16·5	16·2
Births	27·9	29·2	28·4	28·5	28·5	28·7	29·1	29·3
Deaths.....	16·2	17·2	15·4	16·2	16·9	18·2	18·2	17·5

QUARTERS of each Calendar Year, 1904-1898.

(I.) PERSONS MARRIED:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1904.	Mean '94-1903.	1903.	'02.	'01.	'00.	1899.	'98.
March	11·1	11·6	11·1	13·3	10·9	11·0	11·3	11·6
June.....	17·5	16·9	17·5	15·2	17·7	17·8	18·2	17·8
September	17·1	16·9	17·1	17·2	17·6	17·2	17·9	13·7
December	—	17·6	16·7	17·7	17·3	17·8	18·3	18·5

(II.) BIRTHS:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1904.	Mean '94-1903.	1903.	'02.	'01.	'00.	1899.	'98.
March	28·5	29·7	28·6	28·4	28·7	30·2	29·4	29·8
June.....	28·4	29·5	29·0	28·9	28·7	29·2	30·1	29·6
September	27·9	29·1	28·7	29·0	28·7	28·6	28·8	29·6
December	26·8	28·3	27·3	27·7	27·9	27·0	28·2	28·2

(III.) DEATHS:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	1904.	Mean '94-1903.	1903.	'02.	'01.	'00.	1899.	'98.
March	18·2	19·4	16·8	18·5	18·2	22·8	18·7	19·4
June.....	14·8	16·3	14·9	16·1	15·8	17·6	16·6	16·2
September	15·7	16·4	13·9	13·9	17·0	16·4	19·1	17·8
December	16·3	16·9	16·2	16·5	16·7	16·2	18·5	16·7

B.—*Special Town Table*.—POPULATION ; BIRTH-RATE and DEATH-RATE in each Quarter of 1904, in the SEVENTY-SIX Large Towns.

Cities and Boroughs.	Estimated Population in the Middle of the Year 1904.	Annual Rate to 1,000 Living during the Thirteen Weeks ending							
		2nd April, 1904. (1st Quarter.)		2nd July, 1904. (2nd Quarter.)		1st Oct., 1904. (3rd Quarter.)		31st Dec., 1904. (4th Quarter.)	
		Births.	Deaths.	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
Seventy-six towns	15,271,425	29·7	18·7	29·5	15·3	29·0	17·5	28·1	17·5
<i>Including—</i>									
London*	4,649,088	28·7	18·3	28·1	14·8	27·6	16·4	27·2	17·0
West Ham	288,424	33·6	16·7	32·0	13·3	32·4	19·5	31·3	16·3
Croydon	144,419	27·1	15·2	25·7	12·2	24·8	13·6	26·4	14·2
Brighton	126,286	23·4	19·2	23·4	16·5	23·7	14·7	23·4	16·0
Portsmouth	198,038	27·7	18·6	27·1	14·1	29·5	16·6	28·8	18·2
Plymouth	114,003	26·3	20·8	25·3	15·6	24·8	18·9	25·3	18·9
Bristol	343,204	26·8	17·4	28·3	13·9	26·4	13·3	25·5	17·8
Cardiff	176,313	30·3	17·6	30·0	13·3	30·0	14·2	28·1	14·2
Swansea	95,931	31·1	21·9	32·4	15·8	31·2	17·7	30·6	16·6
Wolverhampton	98,194	32·9	16·6	32·2	13·9	27·5	16·6	26·9	14·8
Birmingham	537,965	33·5	22·0	31·7	18·8	31·0	19·3	30·0	19·5
Norwich	115,538	28·2	21·1	25·8	17·5	28·8	17·1	27·7	17·3
Leicester	224,186	26·4	15·8	28·1	12·7	27·5	14·8	24·4	14·7
Nottingham	248,811	27·5	20·1	29·1	15·0	28·0	18·0	26·4	17·7
Derby	120,449	28·5	18·3	28·3	14·2	27·4	13·5	25·1	15·1
Birkenhead	114,814	33·4	20·8	33·2	17·2	33·5	21·6	32·5	19·0
Liverpool†	723,430	33·8	22·6	31·6	18·9	33·8	26·9	32·5	22·0
Bolton	175,744	26·2	19·5	28·7	15·0	26·6	16·0	25·7	17·2
Manchester	557,938	31·4	22·6	31·8	20·0	32·1	20·9	29·7	21·7
Salford	228,983	32·0	21·1	32·4	18·1	32·3	24·0	30·5	21·2
Oldham	139,497	26·0	20·2	25·0	15·7	24·7	16·6	24·0	20·2
Burnley	100,569	26·1	19·5	26·6	18·1	27·7	20·2	25·5	20·2
Blackburn	132,134	24·4	18·3	24·7	17·2	24·6	13·6	19·9	18·5
Preston	115,055	30·1	24·9	29·6	15·8	26·3	16·5	26·4	19·5
Huddersfield	94,925	23·6	18·2	23·2	16·3	24·6	17·0	23·4	18·5
Halifax†	107,580	20·5	17·9	20·2	14·4	19·3	12·4	19·9	17·2
Bradford	285,089	22·6	18·5	23·9	17·1	21·8	17·6	19·9	17·4
Leeds	450,142	28·7	20·4	28·3	17·6	28·0	17·7	26·9	16·3
Sheffield	432,940	33·8	18·0	31·6	14·4	31·8	18·1	30·7	16·7
Hull	253,865	31·0	16·7	31·3	16·4	32·8	21·5	28·9	19·7
Sunderland	151,157	35·3	20·0	35·7	17·9	34·1	18·7	32·8	21·2
Gateshead	118,067	35·3	21·0	36·7	16·3	32·8	17·9	32·7	18·9
Newcastle	225,362	31·0	19·6	30·7	19·0	30·2	18·5	30·3	20·3

* Including deaths of Londoners in the Metropolitan workhouses, hospitals, and lunatic asylums outside the County of London, but excluding deaths of non-Londoners in the London Fever Hospital, the Metropolitan Asylums Hospitals, and the Middlesex County Lunatic Asylum, within the County of London. The deaths in the other towns have been similarly corrected.

† As extended in 1902.

C.—Decisional Table:—MARRIAGES in the Year ending 30th September; and BIRTHS and DEATHS in the Year ending 31st December, 1904, as Registered Quarterly.

1 DIVISIONS. (England and Wales.)	2 AREA in Statute Acres.	3 Enumerated POPULATION, 1901.	4 5 6 7 MARRIAGES in Quarters ending			
			31st December, 1903.	31st March, 1904.	30th June, 1904.	30th September, 1904.
		No.	No.	No.	No.	No.
ENGLD. & WALES....Totals	37,327,479	32,527,843	70,357	44,914	71,430	71,215
I. London	74,839	4,536,541	10,636	6,798	10,547	11,819
II. South-Eastern	3,994,374	3,311,617	7,338	4,008	6,967	6,780
III. South Midland	3,247,169	2,181,174	4,466	2,444	4,448	4,081
IV. Eastern	3,126,517	1,892,299	4,272	2,200	3,504	3,657
V. South-Western	5,023,292	1,913,393	3,934	2,447	3,849	3,688
VI. West Midland	4,051,707	3,679,594	8,127	4,652	8,011	7,846
VII. North Midland	3,495,711	2,042,406	4,593	2,702	4,984	4,236
VIII. North-Western	1,911,104	5,212,156	10,245	7,810	11,480	12,249
IX. Yorkshire	3,721,094	3,596,325	7,666	5,154	8,431	7,723
X. Northern	3,536,522	2,129,051	4,395	3,505	4,997	4,391
XI. Monmthsh. & Wales	5,145,150	2,033,287	4,685	3,194	4,212	4,145

8 DIVISIONS. (England and Wales.)	9 10 11 12 BIRTHS in each Quarter of 1904 ending				13 14 15 16 DEATHS in each Quarter of 1904 ending			
	31st March.	30th June.	30th Septem- ber.	31st Decem- ber.	31st March.	30th June.	30th Septem- ber.	31st Decem- ber.
	No.	No.	No.	No.	No.	No.	No.	No.
ENGLD. & WALES....Totals	240,117	238,891	237,282	228,413	153,255	124,222	133,511	138,405
I. London	33,294	32,536	32,034	31,471	20,672	16,680	18,627	19,147
II. South-Eastern	21,187	20,729	21,096	20,456	13,635	10,744	11,725	11,990
III. South Midland	15,368	15,171	15,468	14,708	8,999	6,961	7,967	7,976
IV. Eastern	14,067	13,755	13,832	13,581	8,241	6,420	7,899	7,336
V. South-Western	11,589	11,220	11,427	11,053	8,631	6,794	6,161	6,965
VI. West Midland	28,639	28,356	27,829	26,835	17,766	14,305	14,490	16,134
VII. North Midland	15,485	15,674	15,609	14,767	9,403	7,384	7,980	8,347
VIII. North-Western	38,721	39,502	38,614	36,501	27,100	22,542	25,059	25,336
IX. Yorkshire	26,461	26,175	26,379	25,094	17,043	14,536	16,005	15,967
X. Northern	18,535	18,659	18,217	17,690	10,725	9,395	9,366	10,459
XI. Monmthsh. & Wales	16,771	17,114	16,777	16,257	11,040	8,461	8,232	8,748

E.—Comparative Table of CONSOLS, PROVISIONS, COAL, and PAUPERISM in each QUARTER of 1902-03-04.

Cols...	1	2	3	4	5	6	7	8				
	Average Prices of									PAUPERISM.		
Quarter ended	CONSOLS (for Money) per 100l. Stock.*	Average Minimum Rate per Cent. of DISCOUNT Charged by the Bank of England.*	WHEAT per Quarter.†	Price per Pound at the Metropolitan Cattle Market (Sinking the Offal).‡						Average Price of Seaborne COAL per Ton in the London Market §	Average Number of PAUPERS Relieved on the Last Day of each Week.	
				Beef.			Mutton.				In-door.	Out-door.
				In- ferior Qual- ity.	Sec- ond Qual- ity.	First Qual- ity.	In- ferior Qual- ity.	Sec- ond Qual- ity.	First Qual- ity.			
1902	£ s. d.	£	s. d.	d.	d.	d.	d.	d.	s. d.			
Mar. 31	94 3 8	3·32	27 3	3 ⁷ / ₈	5 ⁷ / ₈	7	5 ¹ / ₄	7 ¹ / ₄	8 ¹ / ₄	18 9	221,977	498,666
June 30	95 9 2	3·00	29 10	4 ² / ₈	6 ³ / ₄	7 ⁵ / ₈	5 ³ / ₄	7 ³ / ₄	9	17 4	206,911	487,522
Sept. 30	94 17 4	3·00	30 2	4 ⁵ / ₈	6 ⁷ / ₈	7 ⁷ / ₈	5 ¹ / ₂	7 ¹ / ₂	8 ⁵ / ₈	17 4	202,865	484,121
Dec. 31	92 19 4	3·99	25 -	4 ¹ / ₈	6 ¹ / ₂	7 ⁵ / ₈	5 ¹ / ₄	7 ¹ / ₂	8 ⁵ / ₈	18 9	219,166	490,391
1903												
Mar. 31	92 6 10	4·00	25 2	4 ³ / ₈	6 ⁵ / ₈	7 ³ / ₈	5 ¹ / ₂	8 ¹ / ₂	9 ¹ / ₄	17 10	230,105	507,292
June 30	91 12 8	3·70	26 11	4 ¹ / ₈	6	6 ¹ / ₂	5 ¹ / ₂	7 ¹ / ₂	8 ⁵ / ₈	15 6	216,372	491,722
Sept. 30	90 13 6	3·29	28 8	4 ¹ / ₈	6 ¹ / ₂	6 ⁷ / ₈	5 ¹ / ₂	7 ⁵ / ₈	8 ¹ / ₂	15 6	211,111	486,375
Dec. 31	88 9 8	4·00	26 3	3 ⁵ / ₈	5 ³ / ₄	6 ³ / ₄	5 ¹ / ₂	7 ¹ / ₂	8 ³ / ₄	15 11	229,229	496,350
1904												
Mar. 31	86 16 7	4·00	27 5	3 ⁵ / ₈	5 ¹ / ₄	6 ¹ / ₂	5 ³ / ₄	7 ⁵ / ₈	8 ⁷ / ₈	16 8	247,013	521,604
June 30	89 9 9	3·18	27 1	4 ¹ / ₈	5 ³ / ₈	6 ³ / ₄	5 ² / ₄	7 ³ / ₄	8 ³ / ₈	14 10	232,658	509,085
Sept. 30	88 11 10	3·00	28 5	4 ¹ / ₄	5 ¹ / ₂	7 ¹ / ₄	5 ² / ₈	7 ³ / ₈	8 ³ / ₄	14 11**	227,411	506,991
Dec. 31	88 3 8	3·00	30 3	4 ¹ / ₄	5 ¹ / ₄	6 ⁷ / ₈	5 ⁵ / ₈	8	9	14 9	247,345	536,062

* The prices of Consols and the Rate of Discount are furnished by the Chief Cashier of the Bank of England. Up to 31st March, 1903, the prices of Consols relate to stock bearing 2³/₄ per cent. interest; since that date, to stock bearing 2¹/₂ per cent. interest.

† As published by the Board of Agriculture.

‡ Furnished by the Board of Agriculture.

§ Furnished by the Mineral Statistics Department of the Home Office.

|| Sunderland and Hartlepool coal only.

¶ Newcastle and Hartlepool coal only.

** Hartlepool coal only.

F.—ANNUAL DEATH-RATES *per 1,000* from ALL CAUSES and from certain EPIDEMIC DISEASES during the Fourth Quarter of 1904.

Cols.....	1	2	3	4	5	6	7	8	9	10	11
	Births.	Deaths.	Princi- pal Epi- demic Dis- eases, Cols. 4—10.	Small- Pox.	Measles.	Scar- let Fever.	Diph- theria.	Whoop- ing Cough.	Fever.	Diar- rhoea.	Deaths under 1 Year to 1,000 Births.
England and Wales....	26·8	16·3	1·44	0·02	0·39	0·14	0·21	0·20	0·13	0·35	136
76 great towns	28·1	17·5	1·57	0·01	0·42	0·15	0·25	0·18	0·15	0·41	147
142 smaller towns	26·1	15·9	1·63	0·04	0·45	0·19	0·18	0·28	0·13	0·36	145
England and Wales, } less the 218 towns }	25·7	15·1	1·25	0·02	0·34	0·11	0·18	0·20	0·11	0·29	118

No. II.—SCOTLAND.

BIRTHS, DEATHS, AND MARRIAGES, IN THE YEAR

ENDED 31ST DECEMBER, 1904.

—Serial Table :—Number of BIRTHS, DEATHS, and MARRIAGES in Scotland, and their Proportion to the Population estimated to the Middle of each Year, during each Quarter of the Years 1904-1900 inclusive.

	1904.		1903.		1902.		1901.		1900.	
	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.
<i>1st Quarter—</i>										
Births	32,894	28·5	32,109	28·4	31,801	28·5	32,062	29·0	33,134	30·3
Deaths	22,240	19·3	20,931	18·5	22,218	19·9	21,343	19·3	26,106	23·9
Marriages ..	7,619	6·6	7,727	6·8	7,043	6·3	6,940	6·3	7,380	6·7
Mean Tem- perature }	37°·9		39°·9		37°·9		37°·4		36°·0	
<i>2nd Quarter—</i>										
Births	35,082	30·4	36,377	31·9	34,697	30·7	34,646	31·0	34,346	31·0
Deaths	19,519	16·9	19,020	16·7	20,771	18·4	20,029	17·9	19,651	17·8
Marriages ..	8,347	7·2	8,515	7·5	8,575	7·6	8,185	7·3	8,370	7·6
Mean Tem- perature }	49°·3		47°·9		47°·4		50°·0		50°·0	
<i>3rd Quarter—</i>										
Births	32,967	28·3	32,928	28·5	33,263	29·1	33,565	29·7	32,922	29·4
Deaths	16,882	14·5	16,609	14·4	16,022	14·0	18,758	16·6	17,208	15·4
Marriages ..	8,118	7·0	8,235	7·2	8,021	7·0	8,257	7·3	7,965	7·1
Mean Tem- perature }	55°·4		54°·2		53°·8		58°·0		56°·2	
<i>4th Quarter—</i>										
Births	31,627	27·1	32,085	27·8	32,489	28·4	31,905	28·2	30,953	27·7
Deaths	19,320	16·6	19,413	16·8	18,935	16·6	19,973	17·7	19,302	17·2
Marriages ..	8,169	7·0	7,843	6·8	8,239	7·2	7,978	7·1	8,734	7·8
Mean Tem- perature }	42°·5		41°·7		43°·3		41°·3		43°·4	
<i>Year—</i>										
Population .	4,627,656		4,579,223		4,531,299		4,483,880		4,436,958	
Births	132,570	28·6	133,499	29·2	132,250	29·2	132,178	29·5	131,355	29·6
Deaths	77,961	16·8	75,973	16·6	77,946	17·2	80,103	17·9	82,267	18·5
Marriages ..	32,253	7·0	32,320	7·1	31,878	7·0	31,360	7·0	32,449	7·3

II.—*Special Average Table:—Number of Births, Deaths, and Marriages in Scotland and in the Town and Country Districts for each Quarter of the Year ending 31st December, 1904, and their Proportion to the Population; also the Number of Illegitimate Births, and their Proportion to the Total Births.*

Registration Groups of Districts.	Total Births.		Illegitimate Births.		Deaths.		Marriages.	
	Number.	Annual Rate per Cent.	Number.	Per Cent. of Total Births.	Number.	Annual Rate per Cent.	Number.	Annual Rate per Cent.
<i>1st Quarter—</i>								
SCOTLAND	32,894	2·85	2,211	6·7	22,240	1·93	7,619	0·66
Principal towns	15,164	2·95	959	6·3	10,528	2·05	3,883	0·76
Large „	4,694	3·13	236	5·0	2,925	1·95	1,068	0·71
Small „	6,724	2·90	419	6·2	4,088	1·76	1,521	0·66
Mainland rural	5,721	2·50	570	10·0	4,163	1·82	1,000	0·44
Insular „	591	2·07	27	4·6	536	1·88	147	0·52
<i>2nd Quarter—</i>								
SCOTLAND	35,082	3·04	2,151	6·1	19,519	1·69	8,347	0·72
Principal towns	16,158	3·15	1,007	6·2	9,231	1·80	4,433	0·86
Large „	4,980	3·32	217	4·4	2,549	1·70	1,083	0·72
Small „	7,136	3·08	388	5·4	3,699	1·60	1,504	0·65
Mainland rural	6,280	2·74	509	8·1	3,595	1·57	1,271	0·55
Insular „	528	1·85	30	5·7	445	1·56	56	0·20
<i>3rd Quarter—</i>								
SCOTLAND	32,967	2·83	2,162	6·6	16,882	1·45	8,118	0·70
Principal towns	15,032	2·90	985	6·6	7,927	1·53	4,561	0·88
Large „	4,606	3·04	245	5·3	2,255	1·49	1,138	0·75
Small „	6,866	2·93	407	5·9	3,160	1·35	1,432	0·61
Mainland rural	5,818	2·51	498	8·6	3,184	1·37	928	0·40
Insular „	645	2·24	27	4·2	356	1·23	59	0·20
<i>4th Quarter—</i>								
SCOTLAND	31,627	2·71	2,042	6·5	19,320	1·66	8,169	0·70
Principal towns	14,444	2·78	909	6·3	9,346	1·80	4,033	0·78
Large „	4,334	2·86	230	5·3	2,669	1·76	978	0·65
Small „	6,601	2·82	381	5·8	3,594	1·53	1,614	0·69
Mainland rural	5,589	2·41	485	8·7	3,316	1·43	1,404	0·61
Insular „	659	2·28	37	5·6	395	1·37	140	0·49

Population of Scotland.

Population.	Scotland.	Principal Towns	Large Towns.	Small Towns.	Mainland Rural.	Insular Rural.
By Census of 1901.....	4,472,103	1,956,561	578,894	896,880	923,099	116,669
Estimated to the middle of 1904	4,627,656	2,061,296	601,565	930,593	919,637	114,565

III.—*Divisional Table:—MARRIAGES, BIRTHS, and DEATHS Registered in the Year ended 31st December, 1904.*

(Compiled from the Registrar-General's Quarterly Returns.)

1	2	3	4	5	6
DIVISIONS. (Scotland.)	AREA in Statute Acres.	POPULATION, 1901. (Persons.)	Marriages.	Births.	Deaths
		No.	No.	No.	No.
SCOTLAND Totals	19,069,500	4,472,103	32,253	132,570	77,961
I. Northern	2,330,092	112,175	549	2,264	1,717
II. North-Western	4,671,744	162,728	705	3,604	2,677
III. North-Eastern	2,317,773	460,371	3,136	13,147	7,267
IV. East Midland	2,565,126	665,215	4,506	17,462	11,258
V. West Midland	2,576,404	352,981	2,145	10,234	5,790
VI. South-Western	1,440,676	1,862,775	14,857	63,408	35,085
VII. South-Eastern	1,168,149	662,415	5,091	18,016	10,924
VIII. Southern	1,999,536	193,443	1,264	4,435	3,243

No. III.—GREAT BRITAIN AND IRELAND.

SUMMARY of MARRIAGES, in the Year ended 30th September, 1904; and of BIRTHS and DEATHS, in the Year ended 31st December, 1904.

(Compiled from the Quarterly Returns of the respective Registrars-General.)

COUNTRIES	[000's omitted.]		Marriages.	Per 1,000 of Popu- lation.	Births.	Per 1,000 of Popu- lation.	Deaths.	Per 1,000 of Popu- lation
	Area in Statute Acres.	Population Middle 1904 Estimated.						
		No.	No.	Ratio.	No.	Ratio.	No.	Ratio.
England and Wales	37,327	33,703	257,916	7·6	941,703	27·9	549,393	16·2
Scotland	19,070	4,628	31,927	6·9	132,570	28·6	77,961	16·8
Ireland	20,228	4,395	22,770	5·2	103,773	23·6	79,602	18·1
GREAT BRITAIN AND IRELAND }	76,625	42,786	312,613	7·4	1,181,046	27·6	706,956	16·5

Trade of United Kingdom, 1904-1903-1902.—*Distribution of Exports of British and Irish Produce and Manufactures from United Kingdom, according to their Declared Real Value; and the Declared Real Value (Ex-duty) of Imports at Port of Entry, and therefore including Freight and Importer's Profit.*

Merchandise (excluding Gold and Silver) Imported from, and Exported to, the following Foreign Countries, &c.	[000's omitted.]					
	1904.		1903.		1902.	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
	£	£	£	£	£	£
Russia { Northern ports.....	17,697,	6,836,	18,455,	7,820,	16,908,	7,073,
{ Southern ,, 	13,706,	1,381,	12,478,	1,294,	8,766,	1,562,
Sweden	9,711,	4,766,	10,340,	4,426,	9,568,	4,275,
Norway	5,639,	2,960,	5,726,	2,775,	5,409,	2,919,
Denmark	15,914,	3,572,	16,595,	3,992,	15,557,	3,622,
Germany	34,037,	25,137,	34,533,	23,551,	33,634,	22,850,
Holland	34,862,	8,204,	34,974,	8,686,	34,843,	8,446,
Belgium	27,285,	9,011,	27,792,	8,798,	26,539,	8,410,
France	51,071,	15,406,	49,347,	15,890,	50,613,	15,587,
Portugal	2,865,	2,089,	3,370,	2,036,	3,411,	1,841,
Spain	13,688,	4,785,	13,959,	4,575,	14,286,	4,326,
Italy	3,323,	8,364,	3,442,	7,801,	3,582,	7,410,
Austria-Hungary	1,814,	1,894,	2,544,	1,744,	1,340,	1,923,
Greece	1,286,	1,468,	1,432,	1,566,	1,650,	1,716,
Roumania	3,140,	1,060,	4,233,	915,	7,692,	1,224,
Turkey (European and Asiatic) and Crete	5,764,	7,365,	5,868,	5,535,	6,115,	6,050,
Egypt	14,304,	8,275,	12,984,	6,440,	13,765,	6,162,
Java	1,184,	2,910,	512,	2,013,	153,	2,030,
Philippine and Ladrone Isles	2,338,	1,414,	1,986,	663,	2,251,	814,
China, excluding Hong Kong	2,750,	8,801,	2,679,	6,741,	2,407,	7,142,
Japan	2,349,	4,890,	2,276,	4,592,	1,899,	5,066,
United States { Atlantic	116,696,	19,923,	118,324,	22,035,	120,651,	22,887,
{ Pacific	2,656,	355,	3,788,	570,	6,311,	874,
Peru	2,371,	1,127,	1,623,	965,	1,351,	948,
Chile	5,423,	3,272,	4,598,	3,009,	4,524,	2,839,
Brazil	6,221,	5,868,	6,736,	5,606,	6,208,	5,390,
Argentine Republic	23,019,	10,768,	19,144,	8,011,	14,022,	5,871,
Other countries	10,105,	16,911,	9,191,	17,694,	7,990,	15,057,
<i>Total—Foreign Countries</i>	<i>431,218,</i>	<i>188,812,</i>	<i>428,929,</i>	<i>179,653,</i>	<i>421,475,</i>	<i>174,332,</i>
BRITISH POSSESSIONS.						
Channel Isles	1,586,	1,103,	1,655,	1,093,	1,404,	1,003,
Niger Protectorate	1,430,	904,	1,207,	820,	1,164,	691,
Cape of Good Hope	4,933,	12,061,	5,202,	17,676,	5,124,	16,738,
India	31,329,	37,051,	30,030,	31,421,	26,645,	30,108,
Burmah	2,163,	3,566,	2,274,	3,056,	2,079,	2,574,
Straits Settlements	6,287,	3,060,	5,893,	3,126,	6,053,	2,745,
Ceylon	4,147,	1,410,	4,354,	1,440,	4,387,	1,446,
Australia	23,572,	17,234,	17,057,	16,145,	19,733,	19,529,
New Zealand	12,713,	6,314,	13,451,	6,361,	10,884,	5,678,
Canada	22,629,	10,635,	26,670,	11,112,	22,964,	10,345,
British West Indies	1,886,	2,165,	1,609,	2,131,	2,149,	2,009,
Other Possessions	4,358,	16,503,	4,266,	16,766,	4,330,	16,235,
<i>Total—British Possessions</i>	<i>120,063,</i>	<i>112,006,</i>	<i>113,671,</i>	<i>111,147,</i>	<i>106,916,</i>	<i>109,092,</i>
<i>Total — Foreign Countries } and British Possessions }</i>	<i>551,281,</i>	<i>300,818,</i>	<i>542,600,</i>	<i>290,800,</i>	<i>528,391,</i>	<i>283,424,</i>

Trade of United Kingdom, for the Years 1904-1899.—*Declared Value of the Total Exports of Foreign and Colonial Produce and Manufactures to each Foreign Country and British Possession.*

Merchandise Exported to the following Foreign Countries, &c.	[000's omitted.]					
	1904.	1903.	1902.	1901.	1900.	1899.
	£	£	£	£	£	£
Russia { Northern ports	6,705,	6,825,	4,943,	5,094,	4,940,	4,095,
Sweden { Southern „	347,	225,	315,	443,	419,	324,
Sweden and Norway	1,139,	1,282,	1,183,	1,580,	1,687,	1,900,
Denmark*	364,	415,	421,	557,	468,	437,
Germany	11,339,	10,967,	10,214,	10,647,	10,544,	11,982,
Holland	4,681,	5,354,	4,625,	4,655,	3,994,	4,618,
Belgium	4,432,	3,949,	4,210,	4,468,	4,071,	4,750,
France	6,441,	7,347,	6,688,	7,229,	5,900,	6,994,
Portugal	606,	421,	417,	383,	464,	540,
Spain	579,	671,	581,	628,	708,	985,
Italy	849,	671,	684,	681,	672,	740,
Austria-Hungary	676,	672,	588,	698,	641,	636,
Greece	82,	83,	69,	66,	49,	78,
Roumania	96,	53,	128,	73,	30,	42,
Turkey (European and } Asiatic) and Crete	239,	243,	286,	321,	334,	276,
Egypt	162,	120,	107,	104,	159,	163,
Java	103,	13,	14,	25,	27,	22,
Philippine and Ladrone Isles	119,	43,	41,	51,	58,	26,
China, excluding Hong Kong	80,	57,	47,	54,	60,	96,
Japan	152,	126,	211,	77,	159,	343,
United States	19,104,	19,001,	19,320,	19,257,	17,563,	16,856,
Peru	142,	127,	102,	133,	121,	95,
Chile	268,	323,	224,	196,	281,	199,
Brazil	245,	230,	260,	288,	345,	243,
Argentine Republic	724,	592,	251,	221,	296,	307,
Other countries	6,703,	1,316,	1,369,	1,579,	1,544,	1,640,
<i>Total</i>	61,477,	61,236,	57,328,	59,508,	55,534,	58,387,
BRITISH POSSESSIONS.						
Channel Islands	217,	229,	223,	228,	226,	241,
Niger Protectorate	130,	129,	139,	132,	127,	107,
Cape of Good Hope	1,041,	1,221,	1,420,	1,193,	910,	627,
India	901,	844,	810,	768,	851,	651,
Straits Settlements	53,	74,	60,	79,	56,	48,
Ceylon	55,	72,	63,	60,	85,	79,
Australia	2,507,	1,985,	2,000,	2,157,	1,970,	1,846,
New Zealand	586,	593,	481,	409,	413,	393,
Canada	1,617,	1,631,	1,650,	1,545,	1,532,	1,423,
British West Indies	312,	239,	225,	334,	382,	339,
Other Possessions	1,426,	1,320,	1,416,	1,369,	1,096,	902,
<i>Total—British Possessions</i>	8,845,	8,337,	8,487,	8,334,	7,648,	6,656,
Total British, Colonial, and } Foreign Produce	70,322,	69,574,	65,815,	67,842,	63,182,	65,043,

* Including Iceland and Greenland.

IMPORTS.—(United Kingdom.)—For the Years 1904-03-02-01-1900.—Declared Real Value (Ex-duty), at Port of Entry (and therefore including Freight and Importer's Profit), of Articles of Foreign and Colonial Merchandise Imported into the United Kingdom.

[000's omitted.]

FOREIGN ARTICLES IMPORTED.		1904.	1903.	1902.	1901.	1900.
		£	£	£	£	£
RAW MATLS.— <i>Textile</i> , &c.	Cotton, Raw ..	54,698,	44,835,	41,149,	41,970,	40,983,
	Wool	23,036,	23,329,	22,715,	23,642,	23,917,
	Silk*	14,831,	14,485,	15,331,	14,780,	16,347,
	Flax	3,185,	3,676,	2,944,	3,070,	2,512,
	Hemp and Jute ..	8,327,	6,819,	9,214,	8,448,	7,480,
	Indigo	316,	263,	498,	789,	542,
		104,393,	93,407,	91,851,	92,699,	91,781,
" " <i>Various</i> .	Hides	2,047,	2,108,	2,141,	2,770,	3,418,
	Petroleum	5,830,	5,295,	5,194,	5,071,	5,559,
	Oils (other)	3,937,	4,194,	4,444,	4,194,	3,643,
	Metals	29,206,	26,640,	27,304,	27,582,	29,973,
	Tallow	2,249,	1,988,	2,709,	2,333,	2,835,
	Timber	23,638,	27,118,	25,187,	24,562,	27,876,
		66,907,	67,343,	67,279,	66,512,	73,304,
" " <i>Agricul.</i>	Guano	118,	181,	187,	105,	177,
	Oil Seeds	7,425,	8,592,	8,899,	7,880,	7,542,
		7,543,	8,773,	9,086,	7,985,	7,719,
TROPICAL, &c., PRODUCE.	Tea	9,421,	9,667,	8,787,	8,440,	10,687,
	Coffee and Chic... ..	3,558,	3,251,	2,661,	3,371,	2,587,
	Sugar & Molasses ..	18,616,	15,761,	15,002,	19,692,	19,605,
	Tobacco	4,524,	4,178,	5,792,	4,746,	4,799,
	Rice	2,270,	2,051,	2,014,	2,478,	2,408,
	Fruits	11,874,	12,518,	11,707,	9,506,	10,791,
	Wines	3,826,	4,700,	4,942,	4,931,	5,193,
	Spirits	1,583,	1,726,	2,040,	2,271,	2,041,
		55,672,	53,852,	52,945,	56,435,	58,111,
FOOD	{ Grain, Flour, } ..	67,345,	68,455,	64,760,	62,732,	58,943,†
	{ Starch, &c. } ..					
	Provisions	100,041,	101,368,	98,255,	86,113,	80,857,
		167,389,	169,823,	163,015,	148,845,	139,800,
Remainder of Enumerated Articles ..		112,017,	109,616,	104,895,	111,155,	110,919,
TOTAL ENUMERATED IMPORTS ..		513,921,	502,814,	489,071,	483,631,	481,634,
Add for UNENUMERATED IMPORTS ..		37,441,	40,092,	39,320,	38,359,	41,441,
TOTAL IMPORTS		551,362,	542,906,	528,391,	521,990,	523,075,

* "Silk," inclusive of manufactured silk.

† These figures do not include starch, &c.

EXPORTS.—(United Kingdom).—For the Years 1904-03-02-01-1900.—Declared
Real Value, at Port of Shipment, of Articles of BRITISH and IRISH Produce
and Manufactures Exported from the United Kingdom.

[000's omitted.]

BRITISH PRODUCE, &c., EXPORTED.		1904.	1903.	1902.	1901.	1900.
		£	£	£	£	£
MANFRES.— <i>Textile.</i>	Cotton Manufactures ..	74,962,	66,220,	65,054,	65,709,	62,009,
	„ Yarn	8,956,	7,407,	7,404,	7,977,	7,741,
	Woollen Manufactures	18,014,	15,864,	15,261,	14,237,	15,682,
	„ Yarn	5,912,	5,953,	5,197,	5,239,	6,123,
	Silk Manufactures	1,607,	1,437,	1,393,	1,429,	1,638,
	„ Yarn	219,	257,	238,	294,	426,
	Linen Manufactures	5,727,	5,540,	5,430,	5,021,	5,225,
	„ Yarn	902,	840,	842,	825,	934,
		116,299,	103,518,	100,819,	100,731,	99,778,
		5,744,	7,561,	7,517,	5,571,	5,287,
,, <i>Sewed.</i>	Apparel	1,425,	1,902,	1,774,	1,460,	1,534,
	Haberd. and Milnry.					
		7,169,	9,463,	9,291,	7,031,	6,821,
METALS, &c.	Hardware and Cutlery	2,632,	2,280,	2,177,	2,077,	2,140,
	Machinery	21,083,	20,066,	18,755,	17,812,	19,620,
	Iron and Steel	28,083,	30,453,	28,877,	25,282,	31,993,
	Copper and Brass	3,940,	4,130,	3,547,	4,083,	3,556,
	Lead and Tin	1,237,	1,282,	1,193,	1,265,	1,452,
	Coals and Culm	26,862,	27,263,	27,581,	30,335,	38,620,
	Ships (New)	4,460,	4,286,	5,872,	9,149,	8,588,
		88,297,	89,760,	88,002,	90,003,	105,969,
<i>Ceramic Manufets.</i> Earthenware and Glass		3,117,	3,279,	2,998,	3,050,	3,072,
<i>Indigenous Mfrs.</i> <i>and Products.</i>	Beer and Ale	1,729,	1,747,	1,786,	1,783,	1,761,
	Butter and Cheese	90,	100,	116,	95,	93,
	Candles	544,	529,	434,	433,	398,
	Salt	509,	472,	507,	509,	457,
	Spirits	2,710,	2,643,	2,808,	2,632,	2,363,
		5,582,	5,491,	5,651,	5,452,	5,072,
<i>Various Manufets.</i>	Books, Printed	1,831,	1,752,	1,634,	1,553,	1,469,
	Chemicals	8,119,	6,765,	6,537,	6,052,	6,173,
	Furniture	741,	940,	906,	634,	636,
	Leather Manufactures	4,279,	4,322,	3,828,	3,507,	3,398,
	Plate and Watches	621,	578,	530,	501,	459,
	Soap	1,210,	1,144,	1,126,	999,	939,
	Stationery	1,386,	1,415,	1,286,	1,227,	1,070,
		18,187,	16,916,	15,847,	14,473,	14,144,
Remainder of Enumerated Articles		47,856,	48,095,	47,095,	39,736,	38,427,
Unenumerated Articles		14,311,	14,368,	13,721,	19,546,	17,909,
TOTAL EXPORTS		300,818,	290,890,	283,424,	280,022,	291,192,

SHIPPING.—(United Kingdom.)—Account of Tonnage of Vessels Entered and Cleared with Cargoes, from and to Various Countries, during the Years ended Dec., 1904-03-02.

Countries from whence Entered and to which Cleared.	Total British and Foreign.					
	1904.		1903.		1902.	
	Entered.	Cleared.	Entered.	Cleared.	Entered.	Cleared.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
FOREIGN COUNTRIES.						
Russia { Northern ports	2,214,992	1,897,935	2,143,537	1,855,057	1,908,686	1,667,895
{ Southern „	1,219,187	244,215	1,216,532	219,768	865,170	181,140
Sweden	1,741,107	2,040,632	1,829,046	1,969,162	1,786,686	1,886,498
Norway	1,443,646	1,176,801	1,477,088	1,129,854	1,374,105	1,150,915
Denmark	480,192	1,690,885	455,161	1,551,023	428,127	1,493,945
Germany	2,612,675	4,858,559	2,711,518	4,669,235	2,469,435	4,406,854
Holland	2,621,858	2,574,667	2,641,474	2,513,743	2,501,799	2,278,712
Belgium	2,114,168	2,381,372	2,357,609	2,278,977	2,239,198	2,226,050
France	2,752,477	4,879,812	2,638,000	4,861,005	2,740,005	5,057,822
Spain	3,104,635	1,782,949	3,223,723	1,726,988	3,426,912	1,723,720
Portugal	264,217	596,372	268,422	609,004	257,558	582,959
Italy	242,719	3,519,188	309,448	3,456,689	316,359	3,234,527
Austria-Hungary	153,674	395,389	163,622	331,741	105,562	294,725
Greece	205,904	248,073	216,459	243,188	211,496	234,383
Turkey	345,988	372,735	282,246	350,834	355,280	395,055
Roumania	318,337	130,249	406,955	116,256	672,142	130,415
Egypt	401,957	1,326,622	390,022	1,225,617	428,594	1,142,984
Algeria	232,062	296,326	196,433	364,452	207,085	246,252
Portuguese Possessions in } Eastern Africa	69,852	286,494	38,321	261,732	10,139	210,627
United States of America	6,871,316	5,373,701	7,382,838	6,138,589	7,164,163	5,722,134
Mexico, Foreign W. Indies, } and Central America	231,738	324,463	157,943	435,522	139,825	337,106
Republic of Colombia	81,541	290,369	138,752	209,911	147,111	207,409
Brazil	182,864	815,579	212,028	756,993	237,456	799,026
Peru	137,333	96,475	82,170	66,463	78,898	63,887
Chile	197,720	461,258	181,986	318,222	154,064	360,947
Uruguay	10,501	349,287	6,564	312,261	3,689	361,940
Argentine Republic	1,623,527	1,309,302	1,418,492	1,092,008	885,367	935,257
China	26,851	278,511	25,593	125,450	47,649	91,174
Java	77,470	252,319	42,127	163,599	19,097	182,995
Japan	260,763	313,953	319,136	492,975	329,598	475,437
Other countries	454,153	571,356	460,134	536,972	425,783	396,481
<i>Total, Foreign Countries.</i>	32,695,424	41,136,848	33,393,379	40,383,290	31,937,038	38,479,271
BRITISH POSSESSIONS.						
North American Colonies	2,143,543	1,525,321	2,293,742	1,660,629	2,009,427	1,211,135
British India	1,941,457	1,496,873	1,654,985	1,264,496	1,441,778	1,178,597
Mauritius, Ceylon, Straits } Settlements, & Hong Kong }	53,746	607,264	33,113	334,907	30,480	288,282
Australia and New Zealand	1,318,961	1,122,897	885,184	1,079,015	1,067,038	1,031,515
West Indies	212,443	185,523	158,381	180,152	135,544	197,244
Channel Islands	420,463	315,209	398,456	312,004	387,003	323,291
Gibraltar and Malta	85,014	472,188	65,651	363,190	22,520	424,985
Cape of G. Hope and Natal	822,078	1,161,766	778,431	1,399,520	641,188	1,249,821
Other possessions	248,768	442,475	241,695	422,673	232,297	417,944
<i>Total, British Possessions</i>	7,246,473	7,329,516	6,509,638	7,016,676	5,967,275	6,322,811
TOTAL FOREIGN COUNTRIES AND BRITISH POSSESSIONS.						
Twelve Months { 1904.....	39,941,897	48,466,364	—	—	—	—
{ '03	—	—	39,903,017	47,399,966	—	—
{ '02	—	—	—	—	37,904,313	41,802,081

GOLD AND SILVER BULLION AND SPECIE. — (United Kingdom.)
—Declared Real Value of, IMPORTED AND EXPORTED, for the Years
1904-03-02.

[000's omitted.]

Countries.	1904.		1903.		1902.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Imported from—	£	£	£	£	£	£
Australasia	4,687,	274,	5,818,	322,	5,462,	281,
S. America, Mexico, } W. Indies	1,234,	176,	1,430,	204,	1,526,	410,
United States	26,	8,413,	30,	7,597,	51,	8,063,
	5,947,	8,863,	7,278,	8,123,	7,039,	8,754,
France	472,	284,	273,	471,	342,	439,
Germany, Holland, } Belg., and Sweden }	2,441,	523,	1,730,	375,	1,507,	368,
Portugal, Spain, } and Gibraltar	202,	128,	271,	52,	221,	36,
Malta and Egypt.....	33,	52,	290,	16,	869,	27,
China, with Hong } Kong and Japan }	10,	86,	64,	77,	115,	45,
West Coast of Africa	344,	90,	276,	193,	94,	85,
British Possessions } in South Africa }	16,342,	14,	14,020,	70,	7,947,	1,
British East Indies	7,956,	676,	4,334,	906,	3,213,	—
All other Countries	130,	971,	121,	27,	282,	9,
<i>Totals Imported</i>	<i>33,877,</i>	<i>11,687,</i>	<i>28,657,</i>	<i>10,310,</i>	<i>21,621,</i>	<i>9,764,</i>
Exported to—						
France	5,607,	653,	2,636,	1,253,	2,106,	1,076,
Germany, Holland, } Belg., and Sweden }	9,910,	407,	7,128,	465,	806,	372,
Russia	73,	825,	—	131,	—	252,
Portugal, Spain, } and Gibraltar	57,	58,	6,	86,	—	40,
Malta and Egypt.....	4,419	348,	4,736,	56,	1,768,	77,
	20,066,	2,291,	14,506,	1,991,	4,680,	1,817,
B. India, China, } Hong Kong, and } Japan	4,121,	10,038,	3,422,	8,052,	3,603,	7,612,
United States	697,	198,	3,842,	42,	386,	7,
South Africa	1,	10,	182,	53,	1,283,	167,
S. America, Mexico, } W. Indies	6,322,	139,	3,543,	90,	3,290,	85,
All other Countries	1,832,	588,	2,272,	1,239,	2,167,	1,028,
<i>Totals Exported</i>	<i>33,039,</i>	<i>13,264,</i>	<i>27,767,</i>	<i>11,467,</i>	<i>15,409,</i>	<i>10,716,</i>
Excess of imports	838,	—	890,	—	6,220,	—
„ exports	—	1,577,	—	1,157,	—	952,

BANK OF ENGLAND.

Pursuant to the Act 7th and 8th Victoria, cap. 32 (1844),

[0,000's omitted.]

ISSUE DEPARTMENT.					COLLATERAL COLUMNS.	
1	2	3	4	5	6	7
Liabilities.	DATES. (Wednesdays.)	Assets.			Notes in Hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
Notes Issued.		Government Debt.	Other Securities.	Gold Coin and Bullion.		
£	1904.	£	£	£	£	Per cent.
Mlms.		Mlms.	Mlms.	Mlms.	Mlms.	
46,53	Jan. 6	11,02	7,43	28,08	28,91	4
48,04	" 13	11,02	7,43	29,60	28,41	
49,25	" 20	11,02	7,43	30,80	27,99	
50,78	" 27	11,02	7,43	32,33	28,04	
50,19	Feb. 3	11,02	7,43	31,74	28,13	3½
50,69	" 10	11,02	7,43	32,24	27,75	
50,98	" 17	11,02	7,43	32,53	27,52	
51,97	" 24	11,02	7,43	33,52	27,63	
51,50	Mar. 2	11,02	7,43	33,05	27,96	
51,81	" 9	11,02	7,43	33,36	27,71	
52,06	" 16	11,02	7,43	33,61	27,56	
52,18	" 23	11,02	7,43	33,73	27,68	
50,48	" 30	11,02	7,43	33,03	28,98	
49,90	April 6	11,02	7,43	31,45	28,88	
50,46	" 13	11,02	7,43	32,00	28,37	
50,94	" 20	11,02	7,43	32,49	28,13	
50,87	" 27	11,02	7,43	32,42	28,39	
50,23	May 4	11,02	7,43	31,78	28,60	3
49,82	" 11	11,02	7,43	31,37	28,44	
49,10	" 18	11,02	7,43	30,95	28,40	
49,09	" 25	11,02	7,43	30,64	28,37	
49,37	June 1	11,02	7,43	30,92	28,71	
49,79	" 8	11,02	7,43	31,34	28,33	
50,91	" 15	11,02	7,43	32,46	28,05	
51,54	" 22	11,02	7,43	33,09	28,09	
51,71	" 29	11,02	7,43	33,26	28,87	
50,72	July 6	11,02	7,43	32,27	29,32	
50,62	" 13	11,02	7,43	32,17	28,74	
50,87	" 20	11,02	7,43	32,42	28,60	
51,11	" 27	11,02	7,43	32,66	29,01	
50,60	Aug. 3	11,02	7,43	32,15	29,28	3
51,39	" 10	11,02	7,43	32,94	29,00	
52,20	" 17	11,02	7,43	33,75	28,59	
52,97	" 24	11,02	7,43	34,52	28,33	
53,26	" 31	11,02	7,43	34,81	28,70	
54,05	Sept. 7	11,02	7,43	35,60	28,53	
54,59	" 14	11,02	7,43	36,14	28,12	
54,81	" 21	11,02	7,43	36,26	27,84	
55,34	" 28	11,02	7,43	36,89	28,40	
54,33	Oct. 5	11,02	7,43	35,88	28,67	
53,50	" 12	11,02	7,43	35,05	28,40	
53,34	" 19	11,02	7,43	34,89	27,98	
52,99	" 26	11,02	7,43	34,54	28,00	
50,92	Nov. 2	11,02	7,43	32,47	28,25	3
50,31	" 9	11,02	7,43	31,89	27,93	
50,03	" 16	11,02	7,43	31,58	27,69	
49,47	" 23	11,02	7,43	31,02	27,49	
49,22	" 30	11,02	7,43	30,77	28,11	
48,52	Dec. 7	11,02	7,43	30,07	27,87	
48,05	" 14	11,02	7,43	29,60	27,67	
46,57	" 21	11,02	7,43	28,12	28,41	
46,88	" 28	11,02	7,43	28,43	28,20	

—WEEKLY RETURN.

for Wednesday in each Week, during the Year 1904.

[0,000's omitted.]

8	9	10	11	12	13	14	15	16	17	18
BANKING DEPARTMENT.										
Liabilities.					Assets.					Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.	DATES. (Wednesdays.)	Securities.		Reserve.		
Capital.	Rest.	Public.	Private.			Government.	Other.	Notes.	Gold and Silver Com.	
£	£	£	£			£	£	£	£	
Mins.	Mins.	Mins.	Mins.	Mins.	1904.	Mins.	Mins.	Mins.	Mins.	Mins.
14.55	3.48	7.97	44.61	.7	Jan. 6	22.23	28.31	17.62	1.92	70.08
14.55	3.51	6.19	42.94	.14	" 13	20.95	24.96	19.63	1.80	67.33
14.55	3.52	8.22	42.11	.16	" 20	20.93	24.60	21.26	1.77	68.57
14.55	3.54	5.98	43.83	.17	" 27	19.23	24.25	22.73	1.86	68.07
14.55	3.56	6.78	42.92	.13	Feb. 3	19.23	24.79	22.06	1.87	67.95
14.55	3.57	9.08	41.64	.11	" 10	19.23	24.83	22.94	1.96	68.96
14.55	3.62	11.67	40.62	.19	" 17	19.23	25.38	23.46	1.98	70.05
14.55	3.64	14.07	39.60	.20	" 24	19.23	25.53	24.34	1.97	72.00
14.55	3.67	11.12	41.04	.10	Mar. 2	19.22	25.71	23.54	2.01	70.49
14.55	3.68	12.30	39.94	.13	" 9	19.22	25.23	24.10	2.05	70.61
14.55	3.69	13.72	38.64	.18	" 16	19.22	24.99	24.50	2.06	70.78
14.55	3.69	15.31	38.46	.13	" 23	19.22	26.56	24.50	2.06	72.14
14.55	3.72	15.40	40.31	.12	" 30	19.23	31.35	21.50	2.03	74.11
14.55	3.14	11.41	40.66	.10	April 6	20.88	25.95	21.02	2.01	69.87
14.55	3.15	8.57	42.94	.10	" 13	19.88	25.28	22.09	2.05	69.31
14.55	3.16	8.37	44.74	.14	" 20	17.28	28.82	22.81	2.05	70.97
14.55	3.17	8.44	40.91	.13	" 27	17.28	25.37	22.48	2.06	67.20
14.55	3.17	7.54	41.99	.11	May 4	17.28	26.42	21.63	2.04	67.37
14.55	3.17	7.09	40.79	.11	" 11	17.23	25.10	21.38	2.01	65.71
14.55	3.19	7.72	40.00	.15	" 18	17.23	25.36	21.00	2.03	65.61
14.55	3.19	7.40	39.76	.14	" 25	16.96	25.34	20.71	2.04	65.66
14.55	3.13	8.40	40.24	.11	June 1	16.60	27.24	20.66	1.93	66.43
14.55	3.13	7.58	39.18	.11	" 8	16.69	24.37	21.45	2.05	64.56
14.55	3.15	8.20	39.60	.13	" 15	16.69	24.09	22.87	1.95	65.63
14.55	3.15	9.11	40.01	.15	" 22	16.69	24.75	23.45	2.08	66.97
14.55	3.17	9.02	50.26	.16	" 29	15.99	36.25	22.84	2.08	77.15
14.55	3.38	7.92	42.36	.12	July 6	16.90	28.01	21.40	2.01	68.32
14.55	3.39	6.72	41.14	.10	" 13	16.90	25.15	21.87	1.98	65.91
14.55	3.41	7.04	40.84	.9	" 20	16.10	25.21	22.27	2.06	65.95
14.55	3.42	8.41	42.50	.10	" 27	15.70	29.19	22.10	2.00	68.99
14.55	3.46	6.03	41.74	.8	Aug. 3	15.70	26.86	21.32	1.96	65.85
14.55	3.47	6.10	41.37	.11	" 10	14.23	26.97	22.39	2.01	65.61
14.55	3.50	6.53	40.23	.10	" 17	14.23	25.05	23.61	2.02	64.92
14.55	3.52	6.77	41.07	.9	" 24	14.23	25.12	24.64	2.00	66.00
14.55	3.62	6.25	43.45	.13	" 31	14.23	27.32	24.56	1.95	68.05
14.55	3.68	5.39	42.57	.17	Sept. 7	14.23	24.62	25.51	1.99	66.36
14.55	3.68	7.33	40.70	.11	" 14	14.23	24.16	26.48	2.01	66.87
14.55	3.69	8.67	40.54	.8	" 21	14.23	24.30	26.98	2.03	67.53
14.55	3.73	8.40	41.89	.8	" 28	14.23	25.46	26.94	2.03	68.66
14.55	3.13	8.28	43.67	.7	Oct. 5	18.04	23.98	25.66	2.02	69.71
14.55	3.13	5.03	44.24	.9	" 12	16.30	23.65	25.10	2.00	67.04
14.55	3.14	7.61	40.61	.11	" 19	14.81	23.89	25.36	1.96	66.03
14.55	3.14	8.14	42.01	.10	" 26	14.93	25.93	24.99	2.08	67.94
14.55	3.16	7.58	39.62	.9	Nov. 2	15.14	25.20	22.67	1.99	65.00
14.55	3.19	6.85	39.52	.8	" 9	15.16	24.70	22.41	1.91	64.19
14.55	3.20	7.17	39.44	.11	" 16	15.61	24.71	22.35	1.82	64.48
14.55	3.21	8.70	38.33	.11	" 23	15.61	25.49	21.98	1.83	64.91
14.55	3.19	8.27	42.15	.9	" 30	15.61	29.76	21.11	1.78	68.26
14.55	3.18	7.63	41.15	.13	Dec. 7	15.61	28.56	20.65	1.81	66.64
14.55	3.18	7.93	40.45	.11	" 14	15.61	28.61	20.38	1.62	66.23
14.55	3.19	8.59	39.03	.11	" 21	15.61	30.12	18.16	1.58	65.47
14.55	3.20	9.10	44.32	.7	" 28	15.61	35.46	18.68	1.49	71.25

REVENUE OF THE UNITED KINGDOM.

CALENDAR YEARS.

Net Produce in QUARTERS and YEARS ended 31st DEC., 1904-03-02-01

[000's omitted.]

QUARTERS, ended 31st Dec.	1904.	1903.	1904.		Corresponding Quarters	
			Less.	More.	1902.	1901.
	£	£	£	£	£	£
*Customs.....	9,628,	8,717,	—	911,	9,700,	9,275,
*Excise	8,760,	8,570,	110,	—	9,340,	9,580,
*Stamps and estate, &c., duties.....	5,450,	5,260,	—	190,	5,480,	6,230,
Taxes (Land Tax and House Duty)	110,	40,	—	70,	50,	40,
Post Office	4,270,	4,100,	—	170,	3,940,	3,830,
Telegraph Service	970,	920,	—	50,	935,	895,
Property and In- come Tax	29,188,	27,907,	110,	1,391,	29,445,	29,850,
	2,190,	2,060,	—	130,	2,930,	2,660,
Crown Lands	31,378,	29,967,	110,	1,521,	32,375,	32,510,
	180,	180,	—	—	180,	190,
Interest on Advances	1,	3,	2,	—	2,	10,
Miscellaneous	290,	344,	54,	—	530,	362,
Totals	31,849,	30,494,	166,	1,521,	33,087,	33,072,
			NET INCR. £1,355,			

YEARS, ended 31st Dec.	1904.	1903.	1904.		Corresponding Years.	
			Less.	More.	1902.	1901.
	£	£	£	£	£	£
*Customs	35,646,	33,998,	—	1,648,	35,851,	30,192,
*Excise	31,120,	31,290,	170,	—	32,160,	32,990,
*Stamps and estate, &c., duties	19,450,	21,100,	1,650,	—	22,200,	21,720,
Taxes (Land Tax and House Duty)	2,680	2,510,	—	170,	2,550,	2,460,
Post Office	15,850,	15,070,	—	780,	14,640,	14,140,
Telegraph Service	3,760,	3,670,	—	90,	3,610,	3,470,
Property and In- come Tax	108,506,	107,638,	1,820,	2,688,	111,011,	104,972,
	28,510,	37,150,	8,640,	—	35,980,	30,160,
Crown Lands	137,016,	144,788,	10,460,	2,688,	146,991,	135,132,
	460,	455,	—	5,	450,	500,
Interest on Advances	1,010,	960,	—	50,	949,	836,
Miscellaneous	1,416,	1,650,	234,	—	1,893,	1,912,
Totals	139,902,	147,853,	10,694,	2,743,	150,283,	138,380,
			NET DECR. £7,951,			

* Exclusive of transfers to local taxation account.

REVENUE OF THE UNITED KINGDOM.

FINANCIAL YEARS.

*Net Produce in Quarters in 1904, and in Financial Years ended**31st March, 1903-04, 1902-03, 1901-02, 1900-01.*

[000's omitted.]

QUARTERS, ended	31st March, 1904.	30th June, 1904.	30th September, 1904.	31st December, 1904.	31st March, 1905.
	£	£	£	£	£
*Customs	8,286,	9,032,	8,700,	9,628,	—
*Excise	7,600,	7,035,	7,725,	8,760,	—
*Stamps and estate, &c., duties	4,980,	4,545,	4,475,	5,450,	—
Taxes (Land Tax and House Duty) }	2,050,	500,	20,	110,	—
Post Office	5,050,	2,900,	3,630,	4,270,	—
Telegraph Service	810,	900,	1,050,	970,	—
	28,806,	24,912,	25,600,	29,188,	—
Property and In- come Tax	20,800,	4,373,	1,147,	2,190,	—
	49,606,	29,285,	26,747,	31,378,	—
Crown Lands	90,	110,	80,	180,	—
Interest on Advances	400,	—	609,	1,	—
Miscellaneous	392,	442,	292,	290,	—
<i>Totals</i>	<i>50,488,</i>	<i>29,837,</i>	<i>27,728,</i>	<i>31,849,</i>	<i>—</i>

YEARS, ended 31st March,	1903-04.	1902-03.	1903-04.		Corresponding Years.	
			Less.	More.	1901-02.	1900-01.
	£	£	£	£	£	£
*Customs	33,850,	34,433,	583,	—	31,993,	26,262,
*Excise	31,550,	32,100,	550,	—	31,600,	33,100,
*Stamps and estate, &c., duties	20,500,	22,050,	1,550,	—	22,000,	20,805,
Taxes (Land Tax and House Duty) }	2,650,	2,550,	—	100,	2,500,	2,475,
Post Office	15,450,	14,750,	—	700,	11,300,	13,800,
Telegraph Service	3,700,	3,630,	—	70,	3,490,	3,450,
	107,700,	109,513,	2,683,	870,	104,883,	99,892,
Property and In- come Tax	30,800,	38,800,	8,000,	—	31,180,	26,920,
	138,500,	148,313,	10,683,	870,	139,683,	126,812,
Crown Lands	460,	455,	—	5,	455,	500,
Interest on Advances	982,	958,	—	24,	870,	830,
Miscellaneous	1,603,	1,826,	223,	—	1,991,	2,213,
<i>Totals</i>	<i>141,545,</i>	<i>151,552,</i>	<i>10,906,</i>	<i>899,</i>	<i>142,999,</i>	<i>130,385,</i>
			NET DEC. £10,006			

* Exclusive of transfers to local taxation account.

FOREIGN EXCHANGES.—*Quotations as under, LONDON on Paris, Hamburg, Calcutta;—and New York and Hong Kong, on LONDON, for 1904.*

1	2	3	4		5	6	8			9
DATES. (Tuesdays or nearest Dates.)	London on Paris. 3 m. d.	London on Hamburg. 3 m. d.	Calcutta.		Indian Council Bills. Minimum Price per Rupee.*	New York on London. 60 d. s.†	Price per Ounce.			
			London on Calcutta. Demand.				Hong Kong on London. 4 m. d.†		Gold Bars (Fine).	Standard Silver in Bars.
			s.	d.	s.	d.	s.	d.	s.	d.
1904.										
Jan. 5	25·35	20·61	1	4 $\frac{1}{16}$	1	4 $\frac{3}{8}$	4·82 $\frac{1}{2}$	1	9 $\frac{7}{8}$	77 10 $\frac{3}{8}$
" 19	25·36 $\frac{1}{4}$	20·62	1	4 $\frac{1}{16}$	1	4 $\frac{3}{8}$	4·83 $\frac{1}{4}$	1	9 $\frac{1}{4}$	77 9 $\frac{3}{8}$
Feb. 2	25·35	20·63	1	4 $\frac{1}{16}$	1	4 $\frac{3}{8}$	4·83	1	9 $\frac{13}{16}$	77 9 $\frac{1}{2}$
" 16	25·37 $\frac{1}{2}$	20·67	1	4 $\frac{1}{16}$	1	4 $\frac{3}{8}$	4·82 $\frac{7}{8}$	1	10 $\frac{1}{2}$	77 9
Mar. 1	25·35	20·65	1	4 $\frac{1}{16}$	1	4 $\frac{3}{8}$	4·83 $\frac{1}{2}$	1	10 $\frac{3}{8}$	77 9
" 15	25·33 $\frac{3}{4}$	20·63	1	4 $\frac{3}{8}$	1	4	4·84 $\frac{1}{2}$	1	9 $\frac{7}{8}$	77 9 $\frac{1}{4}$
" 29	25·33 $\frac{3}{4}$	20·64	1	4 $\frac{1}{8}$	1	4 $\frac{1}{8}$	4·81 $\frac{1}{2}$	1	9 $\frac{7}{16}$	77 9 $\frac{5}{8}$
Apl. 12	25·32 $\frac{1}{2}$	20·63	1	4	1	4 $\frac{1}{8}$	4·85	1	8 $\frac{7}{8}$	77 10 $\frac{1}{8}$
" 26	25·30	20·60	1	1	1	4 $\frac{1}{8}$	4·85	1	9 $\frac{3}{8}$	77 10 $\frac{1}{2}$
May 10 ...	25·27 $\frac{1}{2}$	20·59	1	4	1	4 $\frac{1}{8}$	4·85	1	9 $\frac{11}{16}$	77 10 $\frac{7}{8}$
" 24 ...	25·25	20·57	1	1	1	4 $\frac{1}{8}$	4·85 $\frac{1}{2}$	1	9 $\frac{5}{8}$	77 10 $\frac{3}{4}$
June 7	25·30	20·57	1	1	1	3 $\frac{3}{4}$	4·85 $\frac{3}{8}$	1	9 $\frac{1}{8}$	77 9 $\frac{3}{4}$
" 21	25·28 $\frac{3}{4}$	20·57	1	1	1	4	4·85 $\frac{1}{4}$	1	9 $\frac{1}{8}$	77 9 $\frac{1}{4}$
July 5 ...	25·28 $\frac{3}{4}$	20·57	1	3 $\frac{3}{4}$	1	3 $\frac{3}{4}$	4·85 $\frac{1}{4}$	1	9 $\frac{15}{16}$	77 9 $\frac{1}{2}$
" 19	25·33 $\frac{1}{4}$	20·59	1	3 $\frac{1}{2}$	1	4	4·85 $\frac{1}{2}$	1	10 $\frac{1}{16}$	77 9 $\frac{3}{4}$
Aug. 2 ...	25·35	20·62	1	3 $\frac{3}{4}$	1	4	4·85 $\frac{1}{4}$	1	10 $\frac{1}{16}$	77 9
" 16	25·33 $\frac{3}{4}$	20·62	1	3 $\frac{3}{4}$	1	4	4·85 $\frac{3}{8}$	1	9 $\frac{11}{16}$	77 9
" 30	25·35	20·61	1	3 $\frac{3}{4}$	1	4	4·84 $\frac{3}{4}$	1	9 $\frac{1}{16}$	78 9
Sept. 13 ...	25·33 $\frac{1}{4}$	20·59	1	3 $\frac{1}{4}$	1	4	4·84 $\frac{1}{2}$	1	9 $\frac{3}{4}$	77 9
" 27 ...	25·30	20·58	1	3 $\frac{1}{4}$	1	1	4·83 $\frac{1}{2}$	1	10 $\frac{1}{16}$	77 9 $\frac{1}{4}$
Oct. 11 ...	25·30	20·58	1	1	1	4 $\frac{1}{8}$	4·83 $\frac{3}{8}$	1	9 $\frac{15}{16}$	77 10 $\frac{3}{4}$
" 25 ...	25·28 $\frac{1}{4}$	20·58	1	1	1	4 $\frac{1}{16}$	4·81	1	10 $\frac{9}{16}$	78 —
Nov. 8 ...	25·30	20·59	1	4 $\frac{1}{8}$	1	4 $\frac{3}{8}$	4·83 $\frac{1}{4}$	1	10 $\frac{5}{16}$	77 11 $\frac{1}{4}$
" 22 ...	25·32 $\frac{1}{2}$	20·60	1	4 $\frac{1}{16}$	1	4 $\frac{1}{16}$	4·84 $\frac{1}{4}$	1	10 $\frac{9}{16}$	77 11 $\frac{1}{2}$
Dec. 6	25·31 $\frac{1}{4}$	20·59	1	4 $\frac{1}{16}$	1	4 $\frac{1}{16}$	4·83 $\frac{3}{8}$	1	10 $\frac{7}{8}$	77 10 $\frac{1}{4}$
" 20	25·32 $\frac{1}{4}$	20·60	1	4 $\frac{1}{16}$	1	4 $\frac{1}{16}$	4·84 $\frac{1}{2}$	1	11 $\frac{1}{2}$	77 10 $\frac{3}{4}$
" 27 ...	25·33 $\frac{1}{4}$	20·60	1	4 $\frac{1}{16}$	1	4 $\frac{1}{16}$	4·84 $\frac{1}{4}$	1	11 $\frac{1}{2}$	77 9 $\frac{1}{2}$

* Wednesdays following.

† Fridays following.

JOURNAL

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1905.

ARTICLE

The Committee on Social Services is hereby authorized to prepare a report on the progress of the work of the committee during the year 1911, and to submit the same to the Board of Directors of the American Society for the Advancement of Social Work.

JOURNAL OF THE ROYAL STATISTICAL SOCIETY.

JUNE, 1905.

SEASONS in the BRITISH ISLES—1875.

E. W. N. SHAW, S.A.D., F.R.S., Secretary.
Meteorological Commission.

[Read before the Royal Statistical Society, 21st March, 1905.
Sir FRANCIS SHARP POWELL, B.A., M.P., President, in the Chair.]

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THE APPLICATION of METEOROLOGY to DEMOGRAPHIC QUESTIONS.

THE representation of the variations of weather of the British Isles, in a form suitable for application to the various economic or demographic questions, is a problem which presents very considerable difficulties, and which needs no elaborate justification as a subject for the consideration of the Royal Statistical Society.

A short experience of the endeavour which the Meteorological Office makes to answer the inquiries with regard to past weather on the part of public bodies or private persons, is sufficient to show that the provision of the future is not by any means the only

problem which presents itself to the administration of the department.

The weather takes a hand in a great number of the operations of Nature that are of economic importance, but very frequently it acts only as an indirect cause of observed effects, and the quantitative relation, which must be regarded as the ultimate object of all inquiries into the economic effects of weather, is not easily established.

Among the special inquiries for which the Office has been asked to supply the necessary meteorological information, besides the specific causes of casualties from storms, &c., by road or rail or sea, may be mentioned, for example, the relation of a local epidemic to what I may call flushes of rain, the effects on certain foreshores of persistence of winds from one direction and, more recently, the relation of grouse disease to weather. I should not be surprised to learn that a considerable number of the correspondents of the Office are somewhat disappointed at the want of definiteness, for the particular purpose in view, of the information which is placed at their disposal, and indeed, with the vast amount of meteorological information that is collected, its insufficiency for apparently simple requirements may be thought astonishing. But some little astonishment may be reserved for the difficulty of formulating a question to which a definite answer can be given from the most ample records. I need not refer to such casual omissions, frequent enough, as the name of the locality where the conditions of weather for a particular hour are desired. I would direct attention, instead, to the inquiry which recurs more frequently than any other, and to which the actual answer desired is ostensibly one single word: Which is the driest, warmest, and sunniest spot in the British Islands? To which I have to reply: Do you mean in summer or winter, or perhaps in spring or autumn? By day or by night? for clear days mean cold and possibly damp nights. Will the average of a number of years be sufficient, or must the behaviour of the places be compared on the basis of the least favourable year? If one place does not satisfy these conditions simultaneously, which condition do you wish to sacrifice? And do you mind if east winds are prevalent in the dry locality?

To these annoying queries I feel sure I should get from a candid correspondent the rejoinder: "You know perfectly well what I mean; I want the place that is best for rheumatism. Why can you not give me a plain answer to a plain question?" And if I were equally candid I should retort: "Because I do not know the answer; when I have sufficient leisure I will inquire about rheumatism, and put a red mark on the map to indicate the

“point which comes out as complying most nearly (statistically) with the requirements. In the meantime let me tell you which localities have been sunniest, which warmest, and which driest, so far as mean values at fixed hours of observation for successive months go, and invite you to use your own judgment as to the way in which you work out the information to give you a single word answer. In any case I must remind you of the possibility that if you build a house there, the particular period of your residence may be marked by weather more unfavourable than any within the memory of the oldest inhabitant.”

I have dwelt at some length on this correspondence, which is only partly imaginary, because I hope it may show that the application of meteorological information to practical life implies the co-ordination of a vast number of more or less interdependent facts. It must be treated in some statistical manner and, therefore, requires some knowledge and experience of statistical methods. For many inquiries, even if one had access to information so ample as to amount to a complete representation of the actual facts in every locality, one could not use such unwieldy material. Some compendium or abstract must be substituted for the isolated facts and, briefly, the problem of meteorological science, as applied to economical and demographic questions, is to reduce the representation of the whole mass of meteorological facts for a given part of the earth's surface to the lowest terms adequate for the solution of any problem that may present itself; and, further, to determine the minimum number of observations that will suffice to give a satisfactory compendium.

The Weekly Weather Report.

I propose to put before you the attempt at the solution of this problem which was put forward by the Meteorological Council shortly after their first appointment. It is represented by the “Weekly Weather Report” of the Meteorological Office, now in the twenty-second year of its revised form and the twenty-eighth of the full series. Afterwards I will give an example of the application of the method to the representation of the seasons. The original form was drawn up after prolonged consideration by a Committee of the Council, consisting of Professor Henry Smith (Chairman), Mr. F. Galton, and Professor, afterwards Sir G. G. Stokes, with Mr. R. H. Scott as Secretary; subsequently Mr. de la Rue's name was added to the Committee. Inquiries from agriculturists and others interested in the matter, with a view to a revision of the form, were initiated by Professor Henry Smith in

1881, but he died before they were completed, and the revision was carried out in 1883 by Sir R. Strachey, who succeeded Professor Smith as Chairman, in conjunction with Mr. Galton. The form has remained the same since that time. It is, so far as I know, an unique attempt at the scientific solution of the problem presented.

It must be remembered that the process of forming an abstract or compendium of the weather must be based upon what I may call the method of samples; we must deal with comparatively few observations in selected localities, at selected intervals, and use them to afford information for a defined region, and for any period. The application of the method to any specific problem may require the use of what may be termed geographical interpolation, or chronological interpolation, or both these processes combined. Following the precedent given by the title of the publication referred to, it may be as well to regard the week as the unit of time adopted, and the primary table, for statistical purposes, as the table of averages of mean temperature (based on the observed maximum and minimum temperature), accumulated temperature above and below 42 degrees, rainfall, number of rain days, duration of sunshine, and the percentage of possible duration, with the differences of these values from the mean for the corresponding period of a number of years.¹ These are given for a number of individual stations on the second page of the "Weekly Report," and are combined in another table given on the first page to give results for certain districts into which the British Isles are divided for the purposes of daily forecasts.

To interpret meteorologically, or to account for, the results for each week, twenty-one maps of the distribution of meteorological elements over Europe are added; they afford the means of chronological interpolation within the weekly period. The distribution of pressure and wind is shown at 8 a.m. and 6 p.m. each day, the distribution of temperature and weather and the state of the sea at 8 a.m.; short descriptions of the course of the weather changes in the twenty-four hours are also given. The scale is small and the information is a good deal compressed, but with the aid of the maps anyone who takes the trouble to master the rudiments of modern meteorology, the relation of weather phenomena to pressure distribution, would have little difficulty in following the sequence of the variations of weather within the week. He could give a very reasonable description of the course of the wind or weather changes in any part of the British Isles. It would not, it is true, be

¹ The weekly mean values for this purpose are obtained by interpolation from curves of monthly mean values.

accepted as evidence in a court of law, but as a mere record of weather it is remarkably concise and effective. There is more real information about the weather to be found in the six pages of a week's report than in any equal area of printed matter in the world.

The only complaint I have to make is that, of the persons for whose use the report is intended, comparatively few have sufficient meteorological training to interpret the weekly results or the daily maps, if they should have occasion to do so. There is a prevalent desire, not unfrequently expressed, that in dealing with the weather technical terms should be entirely avoided, and that the ideas to be conveyed should be expressed in language that can be perfectly understood by those whose knowledge of meteorology and meteorological instruments is confined to the use of the umbrella and the macintosh. The prayer is an impossible one—it belongs to the same order as the desire to deal with botany without using generic and specific names of plants, and to deal with electricity without using volts and amperes. If anyone doubts this, let him try to describe any twenty-four hours of weather over one district of the British Isles—one word may be sufficient to express his feelings, but not to describe the weather. It is remarkable that so few facilities exist for the large number of persons of all classes interested in the weather to acquire the rudiments of its language; but when the time comes for a study of the weather to be incorporated in the scheme of education of the British Isles, there will be an opening for a very interesting examination paper on the relation of pp. 1 and 2 to pp. 3—6 of the "Weekly Report."

Having once established the weekly unit and the summaries for districts, further summarising is, of course, a simple matter. Monthly summaries of an elaborate character are given for the individual stations, with maps representing the monthly distribution of wind, temperature, and rainfall.

The weekly results for temperature, rainfall, and sunshine are reprinted each year in separate tables, so that the general course of the weather in the year can be easily traced; and various other quarterly or annual, or quinquennial summaries are issued.

The Selection of the Unit Period and the Unit Area.

There are two principles which underlie the system adopted in this method of dealing with the meteorological problem that affect its application to practical purposes; they are:—(1) the week as the unit period, and (2) the district as the unit of area. To both of these I wish to direct your attention in turn.

1. With regard to the first, the natural weather period is the year, and the question of what subdivision of the year should be adopted is a very open one. A month is certainly too long, for, in this country, weather hardly ever preserves its characteristics for a whole month, nor has the division into months any meteorological counterpart. Four cold weeks distributed between two warm fortnights might appear in monthly summaries as two months of normal temperature. A similar objection, it is true, might also be raised against the week, but with less justification; a spell of weather often lasts a week, and the characteristics of the different parts of a year are generally fairly represented in the weekly results. A reference to the diagram which represents the average weekly results for twenty years for four divisions of the country (pp. 288 and 289) will show what striking variations take place from week to week within the limits of the several months. The disadvantage of the week is that 52 numbers, sometimes indeed 53, are required to represent the course of a single element for the year. The disadvantage would be still more marked if five days, or any smaller period, were adopted.² To get a rapid survey of the year some summary of the weekly results is desirable.

2. The second question, the division of the country into districts, requires more detailed consideration, having in view the purposes to which the information may be applied.

The meteorological elements whose changes are to be represented vary sometimes regularly, sometimes irregularly, from point to point. The local variations may be very considerable. In the case of rainfall, sunshine, or of minimum temperature, they may indeed be very large; in the case of maximum or mean temperature they are less. It is a question that may fairly be asked, whether the average for a district has any definite meaning, and if so, what are the limits of the district to which the information is applicable.

Towards the solution of these questions it may be remarked that if the district is sufficiently homogeneous, the average for the district is the most satisfactory means of representing the phenomena. The observations for a single station are of very restricted application, and what may be called the eccentricities of the observations at a particular point are really of no general application whatever. It is only in so far as the observations made at a particular point are characteristic of a more or less extended region that they can be applied to the determination of problems concerning effects of weather; and it becomes an important part of the general meteorological problem to manipulate the data from individual

² Periods of ten days and eleven days are utilised by the Deutsche Seewarte for certain statistical results.

stations so as to exhibit the underlying general sequence freed from the obscurities of purely local eccentricities. For making a meteorological sketch we must seek to draw a bold outline with a thick brush, so as to preserve the main features, and leave the strictly local features to be the subject of separate and special treatment.

It may be true, in one sense, that the geographical averages for a district represent the weather changes of no single point on the earth's surface; that there is no point that has the average temperature, the average rainfall, and the average sunshine of a district, and therefore no point to which the figures can be strictly speaking applied; but, on the other hand, it must be remarked that for many purposes the actual numbers are of comparatively little importance, that it is the divergences, generally speaking, from normal values that are the effective elements in the study of weather, and that when the numbers have been compared with the normals, the differences from the mean values for a district suitably selected are a more homogeneous body of figures than the original numerical values, and give a more effective representation of the general course of affairs during the period under consideration than the differences for a single station.

There is, moreover, another point to which reference should be made; if the observations at a single station be the basis of comparison, a break in the continuity of the observations dislocates the whole process; whereas when a number of stations are grouped together the effect of any individual station upon the combined result is relatively small, and the whole series of stations in a district might become changed in process of time, and yet the indication of the weather anomalies from year to year might be satisfactorily preserved.

These considerations may be effectively illustrated by some details taken from the "Weekly Weather Report." The weekly information for that report is grouped according to twelve districts, and the following particulars (Table I) taken from two weeks chosen at random will sufficiently show the line of argument. The districts selected are No. 0, Scotland N., as being the least homogeneous of all, No. 4, the Midland Counties, as extending over regions in the interior of England which permit of considerable variations of meteorological conditions, and No. 3, England East, one of the most homogeneous of the twelve districts. The headings of the columns in the tables are a selection of those on p. 2 of the "Weekly Report." They give the mean temperature for the week at the several stations in the districts, and the difference between the values at each station and the mean value for the corresponding week of thirty years. Similar data are given for rainfall and

TABLE I.—Mean Temperature, Rainfall, and Sunshine at the Stations in Three Districts, with "Differences from the Mean for Corresponding Week."

[From the "Weekly Weather Report" for 1904.]

District.	Week Ending 2nd July, 1904.						Week Ending 31st December, 1904.					
	Temperature			Rainfall			Temperature			Rainfall		
	Average for the Week.	Difference from Mean for Corresponding Week.		Rainfall in the Week.	Difference from Mean for Corresponding Week.		Average for the Week.	Difference from Mean for Corresponding Week.		Rainfall in the Week.	Difference from Mean for Corresponding Week.	
0 Scotland N.	° F.	° F.	Inches.	Inches.	Hours.	Hours.	° F.	° F.	Inches.	Inches.	Hours.	Hours.
	49.1	- 1.9	0.04	0.44	40.4	+ 2.8	40.3	+ 1.0	1.40	+ 0.45	3.7	- 1.9
	54.2	+ 1.1	0.46	- 0.15	48.4	+ 21.9	43.0	+ 3.9	1.29	+ 0.09	6.2	+ 3.7
	51.2	- 2.2	0.38	- 0.03	64.4	+ 28.8	40.5	+ 2.5	0.33	- 0.31	...	...
	53.4	0.0	0.12	- 0.47	...	...	37.3	+ 2.4	1.04	+ 0.17	...	...
	54.9	+ 0.8	0.27	- 0.97	...	...	41.5	+ 4.6	3.12	+ 0.85	...	...
	54.7	- 0.8	0.17	- 0.43	...	...	40.7	+ 2.7	1.70	+ 0.54	...	...
4 Midland Counties	55.3	- 0.2	1.31	+ 0.28	...	...	...	...	...	...	...	...
	55.3	- 1.1	0.56	- 0.07	81.0	+ 35.8	36.7	- 0.3	0.17	- 0.18	6.8	- 2.9
	55.4	- 3.3	0.28	- 0.27	80.3	+ 34.8	38.7	+ 0.8	0.15	- 0.41	7.2	- 2.5
	57.0	- 2.4	0.03	- 0.52	...	...	38.4	+ 1.3	0.15	- 0.31	...	...
	57.9	- 1.5	0.29	- 0.20	...	...	37.8	+ 1.0	0.19	- 0.48	...	...
	56.4	- 0.3	0.11	- 0.56	...	...	39.6	+ 1.4	0.06	- 0.44	...	...
	57.6	- 0.5	0.13	- 0.47	...	...	41.7	+ 2.9	...	...	...	...
3 England E.	55.7	- 3.4	...	...	...	...	39.4	+ 0.8	0.11	- 0.44	...	...
	56.2	- 2.9	0.11	- 0.37	...	...	39.7	+ 2.1	0.14	- 0.50	...	...
	55.3	- 2.7	0.45	- 0.11	...	...	39.4	+ 0.7	0.13	- 0.34	...	...
	58.3	- 1.4	0.12	- 0.41	...	...	...	...	...	...	...	...
	56.7	- 2.2	0.31	- 0.25	77.1	+ 32.1	38.7	+ 1.6	0.22	- 0.30	9.7	+ 0.1
	56.4	- 1.8	0.15	- 0.36	69.4	+ 21.0	40.3	+ 2.5	0.44	- 0.08	4.6	- 6.6
	54.8	- 3.8	0.08	- 0.39	72.5	+ 26.5	39.5	+ 1.3	0.25	- 0.19	8.7	- 1.3
	56.7	- 3.2	0.40	- 0.10	71.8	+ 25.7	38.4	+ 0.8	0.14	- 0.23	10.6	+ 0.7
	57.0	- 1.5	...	...	...	...	40.9	+ 2.4	...	...	...	...
	57.8	- 1.6	...	...	...	...	41.6	+ 2.4	...	...	...	...
	56.3	- 2.5	0.28	- 0.25	...	...	38.8	+ 1.2	0.11	- 0.44	...	...
	58.2	- 1.2	0.37	- 0.00	...	...	41.2	+ 2.3	0.15	- 0.22	...	...

sunshine; but in the case of rainfall the mean values are for thirty-five years, and in the case of the last-mentioned element the number of stations is small, and the mean values are only for twenty years. Upon reference to the table it will be noticed with regard to temperature that in Scotland N. for the summer week the weekly temperature ranged from 49 to 55, and the variations from the mean are somewhat irregular, but comparatively small; for the winter week, with a range from 37 to 43, they are uniformly shown above the average. For the Midland Counties the temperatures of the summer week are, without exception, all below the average. For England E. there are no exceptions for either week. As regards rainfall, the uniformity of departures from mean values is still more marked; there are only two contrary signs shown in the columns for any districts; they are both in Scotland N. At the same time, the differences between districts is clearly shown in the case of the rainfall for the winter week, when Scotland N. had a rainfall above the mean, while the Midland Counties and England E. had deficient rainfalls.

The sunshine data are less concordant, and they are certainly too few in number. In the winter week the discrepancies are sufficiently obvious. But for the other elements it will be clear that the districts are generally homogeneous as regards differences from the normal, whatever the actual values at particular stations may be, and the disregard of isolated values at particular stations, so far from vitiating the effective representation of weather changes, is a necessary process in arriving at a conclusion that is capable of general application.

While this point is under consideration it will be well to add a few remarks upon the limits of accuracy of the readings and, therefore, of the tables made from them. As regards rainfall there would be 365 readings in the year, which total up to something of the order of 30 inches. Half-a-hundredth of an inch, considering the effect of wind and other circumstances, would be a limit of accuracy of observation at a single station against which no objection could be taken; but that admissible error must be referred to the average reading of one-tenth of an inch, so that 5 per cent. is a high estimate of the limit of accuracy of a single station, and any conclusions which depend upon divergencies within 5 per cent. must be accepted with suitable reserve.

For temperature the half of a Fahrenheit degree is a fair limit of accuracy on account of instrumental errors, and the effects of purely accidental local circumstances are at least as large.

It is difficult to estimate these as a percentage, but it is clear that differences of the order of less than one degree cannot be used

with certainty as the basis for the calculation of seasonal or climatic differences. This takes no account of larger accidental errors that may occur in observing or transcribing. These are for the most part eliminated by careful examination and a comparison of the records from groups of neighbouring stations.

Similar remarks apply also to sunshine values; the accuracy of reading of a sunshine card is from 10 to 15 minutes, and as this error may occur on an individual day, it has to be referred to a whole period of sunshine, which may be taken to be say six hours on an average. Again, one cannot base arguments upon statistical differences of less than 5 per cent. Within some limit of accuracy, such as those which I have endeavoured to define, the observations are trustworthy, and the trustworthiness of the readings is supported by a system of regular inspection of the stations and an examination of the instruments and the results. Without such inspection and the critical examination of the records it is in fact difficult to draw any specific conclusions from the combination of meteorological records. It is the necessity for inspection and examination which makes the organisation of a system of stations to give an adequate representation of the meteorological changes of the whole country a work of considerable labour and expense, and one demanding unremitting attention.

In order to give a further illustration of the application of these considerations, I will add two tables which show the relation of the quantities under consideration.

TABLE II.—*Fluctuations about Mean Values. Deviations for the Weeks of One Year (1898) from the Average of Corresponding Weeks.*

[Compiled from the "Weekly Weather Report" of 1898.]

	District 3. England East.	District 10. Ireland South.
Weekly mean temperature—		
Greatest excess above the average for corresponding week.....	9°. 36th and 49th week	8°. 3rd week
Greatest defect from the average for corresponding week.....	5.5°. 12th week	4°. 8th, 12th, 13th week
Average deviation from the aver- age for corresponding week....	3.4°	2.8°
Weekly rainfall—		
Greatest excess above the average for corresponding week.....	1 inch. 47th week	1.6 inch. 47th week
Greatest defect from the average for corresponding week.....	0.6 inch. 28th, 37th, 40th 46th week	0.9 inch. 2nd week
Average deviation from the aver- age for corresponding week....	0.34 inch	0.43 inch
Weekly sunshine—		
Greatest excess above the average for corresponding week.....	24 hours. 36th and 37th week	26 hours. 27th week
Greatest defect from the average for corresponding week.....	24 hours. 24th week	18 hours. 22nd week
Average deviation from the aver- age for corresponding week....	7.5 hours	7.4 hours

TABLE III.—*Fluctuations about Mean Values. Deviations for the Corresponding Weeks (the 36th) of the Twenty-seven Years 1878 to 1904, from the Average for the Twenty Years 1881 to 1900.*

[From the Annual Summaries of the "Weekly Weather Report," 1884 to 1904. See Table VI.]

	District 3. England East.
Temperature (mean, 57·7°)—	
Greatest excess for the week above the average of twenty years	9·5°. 1880
Greatest defect for the week from the average of twenty years	6·1°. 1894
Average deviation for the week from the average of twenty years	3·4°
Rainfall (mean 0·56 inch)—	
Greatest excess for the week above the average of twenty years	1·83 inches. 1884
Greatest defect for the week from the average of twenty years	0·56 inches. 1898
Average deviation for the week from the average of twenty years	0·39 inches
Sunshine (mean 36·4 hours)—	
Greatest excess for the week above the average of twenty years	30 hours. 1891
Greatest defect for the week from the average of twenty years	26 hours. 1896
Average deviation for the week from the average of twenty years	10·7 hours

These tables give a fair indication of the extent of the deviation which the compilation of the readings of temperature, rainfall, and sunshine are intended to represent. The instrumental or observational errors may be roughly assessed at 1 degree for temperature, 0·05 inch for weekly rainfall, and 1 hour for weekly sunshine. It is thus apparent that, when allowance is made for the possible errors of reading, there is still a great variation week by week, or year by year, which can be effectively represented by the figures used, and the process of sketching with a large brush will give an effective representation of the course of the changes which it is desired to represent. This conclusion is fully confirmed by the representation of the variations of the elements exhibited in Table VIII, and the curves of fig. 3 (pp. 288 and 289).

The Forecast Districts of the Meteorological Office.

Let me now turn your attention to the particular system adopted in the "Weekly Report" for the division of the country into districts. I have already stated that for the purposes of the report twelve districts are employed. For various administrative purposes other divisions are employed; the Board of Agriculture has one system, the Registrars-General of Births, Deaths, and Marriages another, the War Office a third; the Marine Department

of the Board of Trade divides the coast. Of these divisions the first two rely on the county as the fundamental unit, and in no case do the divisions disregard the larger political divisions of the United Kingdom. The meteorological divisions are not planned upon any such administrative or historical basis, but are drawn mainly with regard to the physical features. To follow the general course of the weather over the British Isles a system of simultaneous observations over the whole area was essential, and experience showed that the stations at which returns are primarily needed must be distributed along the coast. Hence the land work became connected with and in some degree based on the coast observations, which in turn supply the information needed for storm warnings for the coasts, and the geographical divisions have been described quite reasonably as coastline divisions with their immediate hinterland. This process leaves the inland regions of England, which cannot be regarded as the immediate hinterland of any part of the coast, as an isolated division, to which the name of Midland Counties has been given. It is associated for certain statistical purposes with the eastern coast districts.

The divisions are as follows :—

O. Scotland N.

WESTERN SIDE.

6. Scotland W.
7. England N.W., and N. Wales.
8. England S.W., and S. Wales.
9. Ireland N.
10. Ireland S.

EASTERN SIDE.

1. Scotland E.
2. England N.E.
3. England E.
4. Midland counties.
5. England S.

Channel Islands.

The districts 1 to 5 are grouped together as the principal wheat producing districts, and 6 to 10 as the principal grazing districts. Scotland N., which presents some very striking diversities in characteristics, is excluded from the general classification; the Channel Islands, with the Scilly Isles, from the very special character of their meteorological conditions, form a separate division of their own.

Meteorological conditions are necessarily not subject to any hard and fast lines of demarcation, and fifty miles on one side or other of a boundary line cannot, under conditions commonly occurring, be a matter of vital importance. Hence the modification of the meteorological boundaries to bring them into line with the county boundaries would not be open to serious objection. I have accordingly drawn up a division of the counties of the three Kingdoms following, as nearly as possible, the arbitrary lines of the meteorological districts. The relation of the groups of counties

to the meteorological divisions they are intended to represent is shown by the maps, figs. 1 and 2. I have also prepared a table (Table IV) giving the meteorological and agricultural characteristics of the forecast divisions. It is a summary of a series of corresponding tables giving the meteorological and agricultural characteristics of the individual counties which may be regarded as included in the several forecast divisions. Although this series of twelve tables is too voluminous to be reproduced here, the compilation was a necessary step in the preparation of the summary. It will be convenient if I am able to refer to it by number, and I shall therefore call it Table V, and refer to it in that way.

For the agricultural characteristics I have given in the successive columns 13 to 25 of the county table (Table V), and 9 to 21 of the summary (Table IV), the percentages of the area of the several counties, or of the districts, used in the year 1903 for various agricultural purposes according to the returns of the Board of Agriculture and Fisheries. The number of cattle and sheep in the several counties in the same year are given in columns 26 and 27 of the county table (Table V), and 22 and 23 of the summary (Table IV). I have not thought it desirable to give anything more than the main features of the agricultural characteristics, and consequently I have omitted the crops occupying less than 1 per cent. of the areas of the counties, or less than one-tenth per cent. of the area of the district.

The meteorological characteristics are given in columns 2 to 9 of Table V, and in columns 1 to 7 of Table IV. Accumulated temperature, above and below 42° F., has been used as the index of temperature conditions in the summary, but as the statistics of accumulated temperature have not been compiled for the individual stations used to indicate the meteorological characteristics of the counties in Table V, the annual mean values of maximum and minimum temperatures have been given in that table instead. Mean values of rainfall both for the twenty years, 1881 to 1900, which are used as the basis for comparison in many tables in this paper, and for the longer period of thirty-five years have been given to indicate the stability or instability of the averages.

It has already been stated that the meteorological districts 1 to 5 are grouped as the principal wheat-producing districts, while those numbered 6 to 10 are taken together as the principal grazing districts; this table enables us to form an opinion upon the appropriateness of this scheme of division; but before going into that matter it may be well to call attention to a meteorological point of some importance in this connection.

FIG 1.

Map of the British Isles, showing Meteorological Districts.

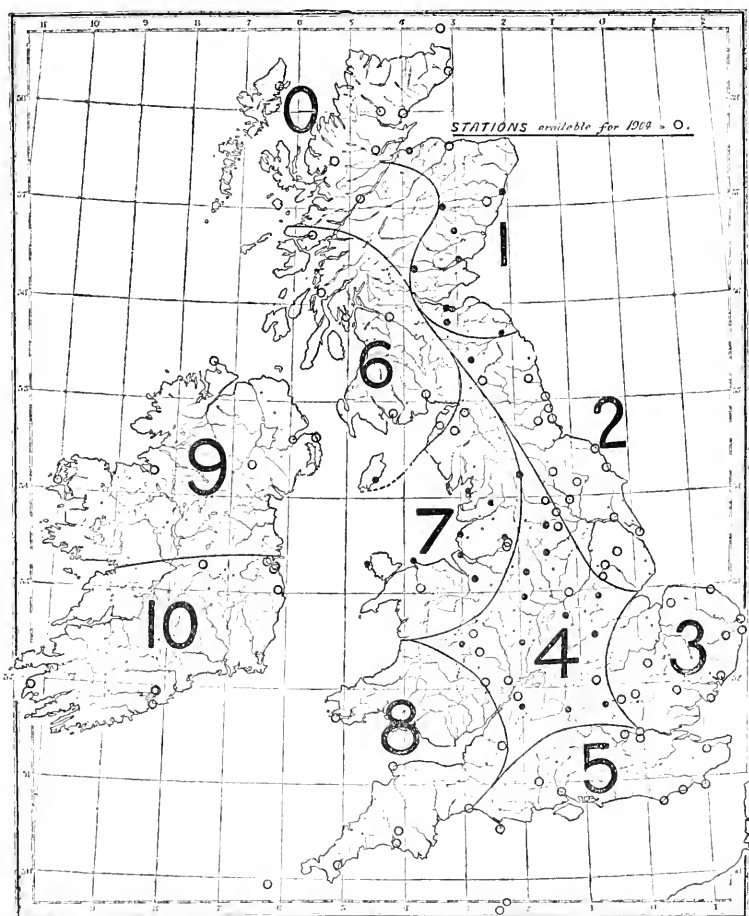


FIG. 2.

Map of the British Isles, showing Groups of Counties representing Meteorological Districts.

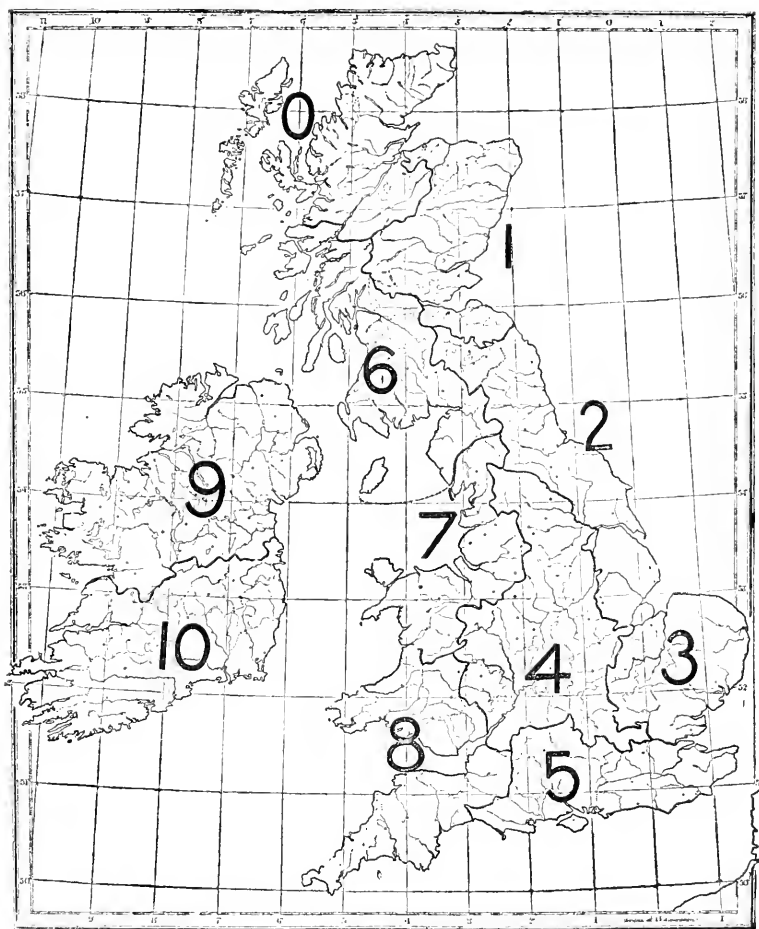


TABLE IV.—*Meteorological and Agricultural Characteristics*

Forecast Districts.	METEOROLOGICAL CHARACTERISTICS (Annual Averages).							Total Area in 1,000 Acres.*	Arable	
	Sunshine. Percent- age of possible, 1881-1900.	Accumulated Tem- perature. Above 42° F., 1881-1900.	Accumulated Tem- perature. Below 42° F., 1881-1900.	Rain-days.		Rainfall.			Wheat.	Barley.
				Average for 30 years, 1871-1900.	Average for 20 years, 1881-1900.	Average for 35 years, 1866-1900.	Average for 20 years, 1881-1900.			
0. Scotland N. ..	26	2,029	803	230	245	49.1	47.3	7,002	0.0	0.4
<i>Principal Wheat-Producing Districts.</i>										
1. Scotland E. ..	30	2,380	902	196	201	31.1	29.0	5,657	0.6	3.0
2. England N.E. . .	33	2,614	714	181	187	25.3	25.0	6,552	4.0	6.2
3. England E. ..	37	3,027	791	183	181	24.4	24.7	4,718	10.5	11.2
4. Midland Coun- ties }	30	2,965	827	173	178	27.7	26.3	9,371	4.0	3.7
5. England S. ..	36	3,360	573	171	172	28.4	26.7	5,355	4.6	3.2
Aggregate for Wheat Districts }	33	2,872	763	181	184	27.4	26.3	31,653	4.3	5.1
<i>Principal Grazing Districts.</i>										
6. Scotland W. } and I. of Man }	31	2,564	604	204	213	50.9	47.3	6,694	0.1	0.2
7. England N.W. } and N. Wales }	30	2,821	567	192	196	35.2	35.1	4,376	1.1	1.1
8. England S.W. } and S. Wales }	37	3,186	426	195	198	38.6	38.8	6,615	1.8	2.5
Aggregate ..	33	2,856	532	197	202	41.6	40.4	17,685	1.0	1.3
9. Ireland N. ..	29	2,723	527	230	229	36.8	37.9	10,403*	0.1	0.2
10. Ireland S. ..	33	3,145	389	208	206	41.0	40.5	8,908*	0.2	1.2
Ireland ..	31	2,934	458	219	218	38.9	39.2	19,311*	0.2	0.4
Aggregate for Grazing Districts }	32	2,889	504	206	208	40.5	39.9	36,996	0.6	1.2
Channel Islands	43	3,795	151	201	210	33.4	32.5	44	3.2	0.

* The areas for districts in Great Britain are exclusive of water (see Agricultural Statistics, 1903, p. 34), and p. 23). The particulars given above are computed from the tables of Agricultural Statistics for 1903, Tables I.

† Area "for hay" only. Mr. R. H. Hooker has kindly worked out the percentage of arable land in Ireland "grass" (mountain and heath in this table). The percentage of arable and pasture land as given in Table D.

of the Forecast Districts of the British Isles. Summary.

AGRICULTURAL CHARACTERISTICS, 1903.

Land. Percentage of Total Area.							Grazing Land, Percentage of Total Area.			Orchards.	Cattle per 1,000 Acres.	Sheep per 1,000 Acres.
Oats.	Other Corn Crops.	Small Fruit.	Hops or Flax.	Green Crops (Potatoes, Turnips, &c.)	Clover, Sainfoin, and Grasses.	Total.	Permanent Pasture.	Mountain and Heath.	Total Grazing Land.			
2.1	—	—	—	1.2	2.2	5.9	2.7	55.2	57.9	—	26	192
9.6	0.2	—	—	6.8	15.1	35.3	7.4	29.9	37.3	—	96	363
6.5	1.4	0.1	—	8.1	8.7	35.0	32.4	20.7	53.1	0.1	111	673
6.8	3.7	0.3	—	11.9	11.1	55.5	23.2	1.8	25.0	0.4	96	330
4.8	1.2	0.2	0.1	5.3	6.7	26.0	52.9	3.7	56.6	1.0	175	424
6.2	1.1	0.5	0.7	7.8	7.8	31.9	40.6	3.2	43.8	0.9	103	477
6.6	1.4	0.2	0.2	7.4	9.3	34.5	34.4	11.5	45.9	0.5	124	467
4.9	0.1	—	—	2.5	9.9	17.7	16.2	51.7	67.9	—	100	534
5.7	0.2	0.1	—	3.6	8.8	20.6	42.3	23.1	65.4	0.1	177	606
5.3	0.2	0.1	—	4.2	10.0	24.1	44.9	15.2	60.1	1.0	177	572
5.2	0.1	0.1	—	2.8	9.5	20.0	33.0	30.0	63.0	0.4	147	560
6.7	0.1	—	0.4†	5.8	3.4‡	16.7	7.5‡	52.2§	59.7	—	228	213
4.5	—	—	—	5.1	3.0‡	14.3	9.1‡	58.0§	67.1	—	257	194
5.7	0.1	—	0.2†	5.5	3.2‡	15.7	8.3‡	54.9	63.2	—	241	204
5.5	0.1	—	0.1†	4.2	6.3	17.8	20.3	43.1	43.4	0.2	197	377
4.1	0.5	0.8	—	26.4	17.7	53.6	16.0	4.5	20.5	2.3	409	9

or those in Ireland are exclusive of "water, roads, fences, &c." (see Agricultural Statistics of Ireland, 1903, II, and IV, and from the Agricultural Statistics of Ireland, 1903, Tables 1, 5, and 9. † Flax.
 levoted to clover and rotation grasses "not for hay" in 1903 at 3.15, which would presumably be included under
 the Irish returns works out at 15.8 and 63.1 respectively. § Entered as "grass" in the returns.

According to the results for the thirty years 1870-99 recently obtained by Dr. H. R. Mill, and published in the "Proceedings of the Institution of Civil Engineers," the average rainfall of the British Isles is about 39 inches. Dr. Mill gives a map showing the distribution of average rainfall, indicating by shades of colour the regions included for each step of 5 inches of average annual rainfall. I have marked out the line of 35 inches rainfall as being a line which separates the districts of distinctly less than average rainfall from those where the rainfall is nearly equal to or above the average for the whole kingdom. In column 3 of Table V I have taken account of the relation of the several counties to this 35-inch line. When the county was practically entirely on the low side of 35 inches the fact was noted and, similarly, when it was on the higher side of the 35-inch line. When the 35-inch line crossed the county in such a way as to make the assignment of the average for the county to one side or other of the line uncertain, a cross was put in the corresponding column. So far as Great Britain is concerned, the line between the so-called wheat-producing and grazing districts is very closely connected with the line between the counties below 35 inches and those above 35 inches of rainfall. The most important exception is in the case of Flint, Cheshire, and the southern part of Lancashire. The meteorological division evidently fails to take account of the exceptionally small rainfall of the Wirral peninsula and its neighbourhood; and the varying conditions of the county of Derby and of the mountainous parts of the West Riding of Yorkshire are against the incorporation of these parts with the Midland Counties and the wheat-producing districts.

A complete discussion of the facts disclosed by these tables would occupy too long a time on this occasion, and a few remarks upon them must suffice. The distinction between "wheat-producing districts" and "grazing districts" of the meteorological divisions has a definite counterpart in the differences of agricultural characteristics as well as in meteorological characteristics. The differences of the latter are exhibited in the diagram, pp. 288 and 289. The propriety of the division into districts is well supported, but Ireland and Wales may need further consideration. Some minor points may be noticed. The county of Perth is a difficult county to classify satisfactorily; it would seem to belong for the most part to Scotland N., but following agricultural precedent it is put in Scotland E.

The counties of Peebles, Selkirk, and Roxburgh are also evidently not in conformity with their environment as parts of the meteorological division England N.E., and the exceptionally irregular conditions of Scotland N. are brought out by the fact

that the 35-inch rain line cuts the district into two parts. Except the Irish districts, the grouping of which has no relation to the rain lines, Scotland N. is the only district which is effectively cut in two by the 35-inch line.

The distribution of districts for the Registrar-General's meteorological returns will be dealt with in a later section of this paper.

Representation of the Seasons.

I now propose to show how the statistical system of the "Weekly Weather Report" can be employed to represent the variations of the seasons in the British Isles since 1878 when the report was first published. For this purpose I will first deal at length with the material for one district (England East), and subsequently give summaries of the meteorological information for the whole country, arranged so as to contrast the conditions for east and west and for north and south respectively.

Table VI is a specimen of the weekly results for district 3 (England East). The full table gives corresponding results for the following elements:—

Rain days.—The days on which at least 0·01 inch of precipitation was measured. As far as possible the days upon which such precipitation as was recorded was to be ascribed to dew and not to rain have been omitted.

Rainfall.—In hundredths of an inch, with the same understanding as in the case of rain days.

Sunshine. The number of hours recorded.

"*Accumulated*" temperature above 42° F., in day-degrees.

Do. do. below 42° F. do.

The method of dealing with the temperature requires some explanation. First, the mean temperature of the day is obtained from the mean of the maximum and minimum readings. For this purpose the difference of the maximum and minimum is multiplied by a factor determined by Sir R. Strachey, and the product is added to the minimum to give the approximate mean temperature for the whole day. The factor varies from month to month, and amounts to 0·465 in June and 0·520 in December.

Then the combined duration and intensity of warmth is estimated from the excess of temperature above the base value 42° F., and also the combined duration and intensity of cold from the depression of temperature below 42° F. The original idea of using a base temperature and estimating warmth as the number of "day-degrees" above the base, and cold as the number of day-degrees below the base, had in view A. de Candolle's suggestion that

TABLE VI.—*Weekly Meteorological Results for*

ENGLAND E.

		Spring.														Totals.
Year.	No. of Week from beginning of Year, see p. 270.															
	10	11	12	13	14	15	16	17	18	19	20	21	22			
1878	...	0·19	0·08	0·32	0·64	0·25	0·53	0·98	0·34	0·11	1·72	1·20	0·79	0·40	7·55	
1879	...	0·14	0·21	0·08	0·65	0·54	0·96	0·65	0·37	0·22	0·10	0·88	1·16	1·55	7·51	
1880	...	0·48	0·02	0·01	0·03	1·14	0·32	0·96	0·34	0·07	0·27	0·04	0·13	0·44	4·25	
1881	...	0·20	0·14	0·29	0·00	0·09	0·46	0·33	0·31	0·09	0·03	0·45	0·43	1·13	3·95	
1882	...	0·08	0·02	1·17	0·04	0·09	0·86	0·35	1·77	0·92	0·03	0·09	0·55	0·27	6·24	
1883	...	0·80	0·37	0·18	0·11	0·00	0·01	0·79	0·93	0·28	0·79	0·01	0·57	0·00	4·84	
1884	...	0·67	0·02	0·09	0·05	0·64	0·20	0·10	0·48	0·77	0·21	0·08	0·00	0·00	3·31	
1885	...	0·64	0·01	0·18	0·18	0·22	0·53	0·26	0·45	0·65	0·65	0·43	1·41	0·24	5·85	
1886	...	0·15	0·06	0·35	0·42	0·40	0·82	0·25	0·02	0·14	0·07	1·54	0·82	0·44	5·43	
1887	...	0·32	0·20	0·76	0·40	0·03	0·06	0·48	0·58	0·65	0·26	0·68	0·30	0·41	5·13	
1888	...	1·04	0·39	0·92	0·47	0·21	0·30	0·93	0·09	0·20	0·00	0·49	0·00	0·22	5·26	
1889	...	0·72	0·02	0·43	0·23	0·42	0·63	0·08	0·74	0·36	1·35	0·29	1·31	0·34	6·92	
1890	...	0·27	0·23	1·40	0·40	0·00	0·36	0·15	0·39	0·07	1·20	0·16	0·13	0·12	4·83	
1891	...	0·28	0·47	0·31	0·51	0·46	0·14	0·02	0·34	0·12	0·22	1·36	0·88	0·80	5·91	
1892	...	0·27	0·23	0·54	0·13	0·00	0·76	0·24	0·60	0·59	0·06	0·29	0·49	0·38	4·53	
1893	...	0·00	0·09	0·00	0·00	0·00	0·01	0·10	0·02	0·08	0·00	0·40	0·32	0·18	1·20	
1894	...	0·35	0·58	0·01	0·00	0·13	0·44	0·46	0·97	0·23	0·78	0·17	0·85	0·74	5·71	
1895	...	0·49	0·03	0·33	0·91	0·36	0·01	0·12	0·61	0·05	0·00	0·51	0·23	0·53	4·18	
1896	...	0·62	0·40	1·19	0·62	0·42	0·20	0·51	0·03	0·13	0·00	0·02	0·50	0·00	4·69	
1897	...	0·47	0·79	0·18	0·33	0·30	0·54	0·26	0·52	0·16	0·28	0·45	0·33	0·42	5·03	
1898	...	0·01	0·13	0·96	0·25	0·15	0·51	0·01	0·53	0·74	0·51	0·69	0·13	0·81	5·43	
1899	...	0·12	0·04	0·64	0·27	0·76	0·85	0·21	0·55	0·01	0·20	1·22	0·68	0·00	5·55	
1900	...	0·06	0·05	0·47	0·18	0·56	0·19	0·20	0·08	0·08	0·66	0·04	0·46	0·67	3·70	
Mean 20 yrs.	{	0·38	0·21	0·52	0·28	0·26	0·39	0·29	0·50	0·32	0·37	0·47	0·52	0·39	4·89	
1901	...	0·71	0·19	0·36	0·51	0·83	0·84	0·37	0·06	0·05	0·72	0·00	0·02	0·40	5·06	
1902	...	0·11	0·39	0·20	0·45	0·68	0·06	0·20	0·17	0·14	0·58	0·91	0·67	0·76	5·32	
1903	...	0·27	0·21	0·56	0·92	0·06	0·34	0·07	0·83	1·07	0·72	0·25	0·09	0·01	5·40	
1904	...	0·18	0·08	0·11	0·77	0·17	0·30	0·24	0·06	0·76	0·20	0·12	0·41	0·45	3·85	

District 3, England East, from 1878 to 1904.

WEEKLY RAINFALL.

Year.	Summer.														Totals.
	No. of Week from beginning of Year, see p. 270.														
	23	24	25	26	27	28	29	30	31	32	33	34	35		
1878 ...	0·40	0·96	0·47	0·04	0·08	0·04	0·18	0·65	0·63	0·79	1·14	0·71	1·14	7·23	
1879 ...	0·93	1·15	0·43	1·11	0·97	0·91	1·79	0·22	2·57	0·15	0·55	1·39	0·82	12·99	
1880 ...	0·90	0·31	0·72	0·65	1·01	0·82	0·93	1·31	0·90	1·05	0·03	0·08	0·20	8·91	
1881 ...	0·19	0·45	0·31	0·00	0·59	0·01	0·18	0·74	0·68	0·96	0·87	1·70	0·68	7·36	
1882 ...	0·95	1·11	0·96	0·01	0·82	1·12	0·26	0·26	0·02	0·04	0·68	1·01	0·42	7·66	
1883 ...	0·03	1·10	1·70	0·53	0·49	1·11	1·20	0·24	0·38	0·43	0·10	0·06	0·59	7·96	
1884 ...	1·14	0·01	0·07	0·08	0·44	0·61	0·85	0·72	0·01	0·13	0·44	0·34	1·11	5·95	
1885 ...	1·23	0·00	0·29	0·14	0·01	0·40	0·14	0·00	0·01	0·45	0·18	0·61	0·17	3·63	
1886 ...	0·17	0·30	0·22	0·04	0·00	0·83	0·83	1·50	0·37	0·38	0·65	0·61	0·00	5·90	
1887 ...	0·02	0·00	0·00	0·12	0·12	0·61	0·17	0·43	0·00	0·31	0·53	0·39	1·06	3·76	
1888 ...	0·19	0·38	0·55	1·49	0·92	0·89	0·46	1·89	1·20	0·01	0·40	0·50	1·27	10·15	
1889 ...	1·77	0·02	0·02	0·00	0·03	2·25	0·41	0·54	0·62	1·21	0·37	0·72	0·68	8·64	
1890 ...	0·37	0·66	0·24	0·64	1·30	0·55	2·27	0·07	0·22	0·08	0·95	0·50	0·48	8·33	
1891 ...	0·01	0·07	0·65	0·44	0·79	0·29	0·79	1·16	0·83	0·39	1·60	0·77	0·32	8·11	
1892 ...	0·27	0·19	1·24	0·95	0·62	1·04	0·88	0·00	0·17	0·17	1·41	0·97	0·76	8·67	
1893 ...	0·37	0·00	0·53	0·26	0·46	0·92	0·78	0·44	1·09	0·77	0·00	0·38	0·13	6·22	
1894 ...	1·07	1·05	0·24	0·01	0·21	1·43	0·61	0·87	0·25	0·59	0·34	1·25	0·01	7·93	
1895 ...	0·03	0·26	0·03	0·18	0·61	0·30	0·90	1·64	0·90	1·39	1·21	0·57	0·16	8·18	
1896 ...	0·41	1·21	0·05	0·29	0·11	0·39	0·42	0·07	0·35	0·61	0·28	0·60	0·66	5·45	
1897 ...	0·90	0·89	0·17	0·12	0·04	0·09	0·23	0·23	0·34	0·64	0·68	0·78	0·88	5·90	
1898 ...	1·14	0·06	0·48	0·89	0·05	0·03	0·21	0·69	0·46	0·66	0·21	0·07	0·22	5·17	
1899 ...	0·00	0·00	0·49	1·03	0·34	0·66	0·43	0·69	0·01	0·02	0·49	0·01	0·45	4·02	
1900 ...	0·45	0·33	0·56	0·67	0·49	0·02	0·48	0·23	1·05	1·54	0·13	0·67	0·34	6·96	
Mean 20 yrs. }	0·54	0·40	0·44	0·39	0·42	0·64	0·63	0·62	0·45	0·54	0·58	0·63	0·52	6·80	
1901 ...	0·00	0·24	0·53	0·14	0·94	0·14	0·00	0·71	0·02	0·04	0·58	0·00	0·80	4·14	
1902 ...	0·83	1·46	0·23	0·02	0·43	0·56	0·39	0·65	0·20	1·50	0·13	1·07	0·19	7·66	
1903 ...	0·78	3·00	0·00	0·00	0·04	0·84	1·99	1·14	0·36	1·37	1·04	0·93	0·34	11·83	
1904 ...	0·15	0·27	0·15	0·25	0·31	0·07	0·03	1·86	0·01	0·20	0·45	0·68	0·81	5·24	

TABLE VI.—Weekly Meteorological Results for

ENGLAND E.

Year.	Autumn.													Totals.	
	No. of Week from beginning of Year, see p. 270.														
	36	37	38	39	40	41	42	43	44	45	46	47	48		
1878	...	0.04	0.35	0.64	0.49	0.31	0.26	0.70	0.85	0.52	1.88	2.28	0.27	1.02	9.61
1879	...	0.14	0.85	0.27	1.49	0.55	0.03	0.49	0.29	0.15	0.01	0.11	0.67	0.45	5.50
1880	...	0.03	1.26	2.24	0.13	0.87	1.68	0.10	0.49	1.54	0.20	1.20	0.51	0.34	10.59
1881	...	0.56	0.19	1.24	0.06	0.68	0.85	0.86	0.47	0.48	0.05	0.44	1.04	0.45	7.37
1882	...	0.36	0.64	0.49	0.83	0.22	1.20	1.39	2.32	1.03	0.33	0.91	0.47	0.94	11.13
1883	...	0.65	0.09	0.64	2.13	0.87	0.55	0.46	0.21	1.08	0.50	0.87	0.69	0.70	9.44
1884	...	2.39	0.09	0.25	0.04	0.05	2.32	0.01	0.21	0.29	0.46	0.11	0.50	0.58	7.30
1885	...	1.04	1.80	0.65	0.72	0.31	1.54	1.17	1.46	1.07	0.97	0.25	0.08	1.57	12.63
1886	...	0.47	0.56	0.00	0.32	0.05	0.62	1.51	0.42	0.35	0.83	1.53	0.22	0.04	6.92
1887	...	0.39	0.59	0.14	0.61	0.50	0.59	0.30	0.90	1.30	0.59	0.21	0.35	0.20	6.67
1888	...	0.45	0.05	0.20	0.18	0.45	0.15	0.00	0.38	1.39	0.52	0.40	0.63	0.67	5.37
1889	...	0.13	0.01	0.64	1.44	0.74	0.34	1.32	0.99	0.50	0.02	0.09	0.33	0.35	6.90
1890	...	0.16	0.00	0.44	0.21	0.02	0.22	0.46	0.25	0.83	0.85	0.30	0.26	1.60	5.60
1891	...	0.05	0.60	0.38	0.52	0.95	0.94	1.73	0.39	0.09	0.97	0.41	0.41	0.78	8.22
1892	...	0.13	0.00	1.06	0.98	1.96	1.29	0.72	1.03	1.48	0.11	0.71	0.33	0.39	10.19
1893	...	0.16	0.02	0.14	0.49	0.75	1.15	0.50	0.18	0.33	0.22	1.24	1.06	0.62	6.36
1894	...	0.86	0.12	0.11	0.96	0.23	0.29	0.64	0.89	0.77	0.53	2.35	0.13	0.02	7.90
1895	...	0.55	0.69	0.01	0.01	0.64	1.11	0.19	0.70	0.43	1.36	0.52	0.50	0.63	6.74
1896	...	1.39	1.42	0.53	1.36	0.12	0.95	1.28	1.00	0.27	0.60	0.45	0.07	0.05	9.49
1897	...	0.76	0.53	0.39	1.35	0.06	0.15	0.38	0.05	0.05	0.17	0.27	0.30	0.68	5.14
1898	...	0.00	0.00	0.08	0.17	0.02	0.49	1.37	0.57	0.44	0.10	0.04	1.63	0.32	5.23
1899	...	0.54	0.31	0.57	1.25	0.80	0.14	0.03	0.94	1.65	1.40	0.01	0.04	0.15	7.83
1900	...	0.08	0.01	0.11	0.33	0.51	0.16	0.31	0.67	0.84	0.37	0.66	0.48	0.30	4.83
Mean } 20 yrs. }		0.56	0.36	0.40	0.70	0.50	0.75	0.73	0.70	0.73	0.55	0.59	0.47	0.55	7.59
1901	...	0.01	0.31	0.61	0.07	0.70	0.60	0.61	0.14	0.06	0.03	1.24	0.23	0.17	4.78
1902	...	0.67	0.90	0.05	0.02	0.07	0.65	0.54	0.24	0.10	0.28	0.07	0.01	0.66	4.26
1903	...	1.22	0.23	0.33	0.73	1.22	1.52	0.70	0.79	0.25	0.32	0.30	1.04	0.31	8.96
1904	..	0.32	0.20	0.24	0.42	0.37	0.00	0.45	0.22	0.07	0.88	0.03	0.54	0.06	3.80

District 3, England East, from 1878 to 1904—Contd.

WEEKLY RAINFALL.

Year.	Winter.													Totals.
	No. of Week from beginning of Year, see p. 270.													
	49	50	51	52	1	2	3	4	5	6	7	8	9	
1878-79...	0·34	0·19	0·08	0·88	1·09	0·20	0·63	0·02	0·18	1·36	1·08	0·28	0·29	6·62
1879-80...	0·33	0·08	0·03	0·10	0·29	0·02	0·19	0·04	0·03	0·55	0·72	0·89	0·08	3·35
1880-81...	0·10	0·17	0·64	1·03	0·08	0·29	0·25	0·48	0·90	1·27	0·36	0·40	1·10	7·07
1881-82...	0·84	1·72	0·27	0·34	0·83	0·03	0·00	0·31	0·00	0·08	0·89	0·22	0·63	6·16
1882-83...	0·98	0·14	0·74	1·04	0·25	0·48	0·18	1·03	0·49	1·59	0·64	0·03	0·27	7·86
1883-84...	1·01	0·58	0·02	0·09	0·37	0·11	0·01	0·90	0·44	0·16	0·16	0·49	0·40	4·74
1884-85...	0·96	0·38	0·89	0·12	0·04	1·13	0·29	0·14	0·67	0·45	0·84	0·22	0·49	6·62
1885-86...	0·19	0·31	0·04	0·28	0·59	0·71	0·71	0·70	0·33	0·16	0·22	0·03	0·46	4·73
1886-87...	0·65	0·83	0·60	1·47	0·78	0·34	0·23	0·04	0·35	0·00	0·30	0·02	0·01	5·62
1887-88...	0·39	0·48	0·26	0·22	0·08	0·05	0·18	0·33	0·17	0·46	0·81	0·12	0·07	3·62
1888-89...	0·24	0·02	0·51	0·38	0·02	0·48	0·16	0·03	0·32	0·81	0·31	0·27	0·14	3·69
1889-90...	0·49	0·15	0·48	0·16	0·27	0·38	0·19	0·49	1·00	0·06	0·53	0·05	0·31	4·56
1890-91...	0·11	0·01	0·24	0·12	0·28	0·30	0·63	0·59	0·02	0·02	0·01	0·01	0·34	2·63
1891-92...	1·04	0·60	0·08	0·59	0·32	0·27	0·13	0·20	0·12	0·34	0·79	0·33	0·32	5·13
1892-93...	0·59	0·22	0·00	0·03	0·38	0·34	0·54	0·53	0·61	0·32	0·41	1·09	0·86	5·92
1893-94...	0·35	0·55	0·60	0·08	0·32	0·26	0·53	0·45	0·45	0·11	0·42	0·18	0·49	4·79
1894-95...	0·23	0·87	0·49	0·27	0·99	0·26	0·97	0·86	0·34	0·06	0·03	0·04	0·27	5·68
1895-96...	0·18	0·75	0·10	0·34	0·45	0·10	0·36	0·53	0·12	0·08	0·05	0·16	0·22	3·44
1896-97...	0·97	0·76	0·27	0·68	0·99	0·37	0·35	0·21	1·66	0·16	0·36	0·02	0·99	7·79
1897-98...	0·76	0·55	0·02	0·49	0·72	0·02	0·02	0·05	0·62	0·11	0·14	0·14	0·36	4·00
1898-99...	0·96	0·06	0·41	0·80	0·38	0·84	0·66	0·16	0·23	0·69	0·46	0·02	0·05	5·72
1899-1900	0·63	0·21	0·17	0·46	1·19	0·33	0·59	0·59	0·73	0·19	1·41	1·30	0·43	8·25
1900-01...	0·69	0·20	0·22	0·48	1·13	0·06	0·20	0·11	0·26	0·17	0·41	0·32	0·62	4·37
Mean 20 yrs. }	0·61	0·47	0·32	0·42	0·52	0·34	0·35	0·41	0·45	0·30	0·46	0·25	0·39	5·29
1901-02...	0·33	2·10	0·12	1·10	0·62	0·05	0·04	0·11	0·35	0·15	0·10	0·15	0·45	5·67
1902-03...	0·95	0·11	0·58	0·07	0·59	0·12	0·40	0·33	0·03	0·03	0·06	0·47	0·72	4·46
1903-04...	1·01	0·04	0·08	0·06	0·40	0·47	0·36	0·53	0·77	1·18	0·59	0·02	0·46	5·97
1904-05...	1·08	0·66	0·05	0·21	0·24	0·20	0·42	0·04	0·03	0·18	0·26	0·22	0·32	3·91

growth of vegetation can only take place when the temperature of the air is above a certain base temperature. The base temperature used in the "Weekly Weather Report" is 42° F. I need not here enter into a discussion as to the practical applicability of the suggestion, or the appropriateness of 42° as a base temperature for wheat or other particular growths. The computation of the values above and below 42° F. was introduced into the "Weekly Weather Report" at the suggestion of, and after some correspondence with, Sir J. Lawes and Sir J. Gilbert, of the Rothamsted Experimental Farm; and as the tables, and particularly the diagram on pp. 288 and 289 will show, the division of the scale of temperature at that point gives a very useful means of comparing the seasons. The diagram shows that for the wheat-producing districts the agricultural summer of the months of June, July, and August are months in which there is practically no accumulated temperature below 42° F., and the coldness of spring and autumn is very usefully identified by the extent of the accumulated temperature below 42° .

The computation of these accumulated temperatures above and below 42° presents no difficulty if the daily extremes are both on the same side of the base temperature. Ten day-degrees for a day would mean that the mean temperature was 10° above or below the base; and 98 day-degrees for a week would mean that the average temperature for the week was 14° F. above or below this base, *i.e.*, it was 56° F. or 28° F. according as the day-degrees were to be reckoned above 42° or below 42° . When however the minimum and maximum are on opposite sides of the base temperature the accumulated temperature for this day must be separated into two parts, and the evaluation of the two parts is a matter of computation. From the shape of the curve, which represents the average daily variation of temperature between its extremes, a code of rules has been drawn up by Sir R. Strachey,³ whereby the computation is made. Particulars as to the mode of making the computation and the basis of the rules is given in the preface to the "Weekly Weather Report" of 1884.

The figures for the individual weeks have been grouped in the tables so that corresponding weeks in consecutive years are vertically under each other; and the vertical rows have been separated into groups for the tenth to the twenty-second week, to represent spring, the twenty-third to the thirty-fifth, summer, the thirty-sixth to the forty-eighth, autumn, the forty-ninth to the ninth of the next year, winter. The vertical grouping compares weeks at

³ See Appendix II, p. [13]. "Quarterly Weather Report," 1878.

corresponding periods of the year throughout the interval from 1878 to 1904, but as the year does not contain an exact number of weeks, the corresponding weeks of consecutive years begin on different days. The extent of the variation is at most three days on either side of 1st January as the commencing day of the year. In some years there are 53 weeks; for the purpose of the comparison these extra weeks have been simply omitted. The years are here grouped in fives, commencing with the year 1881, and the averages are taken for the two complete decades 1881-1900. Subsequently the individual weeks have been compared with these averages, and in order to enable the reader to identify rapidly the periods of excess or defect of the individual values of the elements from the mean for the twenty years, figures for weeks below the mean are printed in different type from those for weeks equal to or above the mean. Thus in the rainfall table, which is here reproduced as a specimen, all except "dry" weeks, *i.e.*, weeks with rainfall less than the mean of the twenty corresponding weeks, are shown by figures in black (Clarendon) type. In the complete scheme a similar means of identification is adopted for "fair weeks" in the rain-days' table, *i.e.*, for weeks with fewer rain days than the mean. "Sunny-weeks," *i.e.*, weeks with an amount of sunshine equal to or above the mean, "warm weeks," *i.e.*, weeks with accumulated temperature above 42° equal to or above the mean, and also "chilly weeks," *i.e.*, weeks in which the accumulated temperature below 42° is equal to or greater than its mean value, are also identified by the figures representing them being printed in Clarendon type. These adjectives have been adopted merely for the convenience of reference, and no stress whatever is laid upon them as conveying a very precise or complete description of the weeks to which they are applied. The results of the comparison for the different seasons of the individual weeks with mean values are given in another table.

Corresponding tables are available for the individual districts, and will be published in due course by the Meteorological Office, as a compendious representation of the variations of the seasons in the twelve districts dealt with in the "Weekly Weather Report."

Attention has already been directed to the identification of the seasons by the accumulated temperature below 42° . It is apparent that a slightly better separation would be made if the technical summer and autumn were each delayed a week, the periods actually chosen being taken to agree, approximately, with divisions into calendar months.

The differences in the accumulated temperatures for the several districts given in Table IV also illustrate the utility of this method of computation. The accumulated temperatures above 42° F. there

shown range from 3,795 day degrees for the Channel Islands to 2,029, scarcely more than half, for Scotland N., and those below 42° F. from 151 for the Channel Islands to 902 for Scotland E., with 827 for the Midland Counties.

It would serve no useful purpose to attempt a verbal description of the results of this table. It is intended to be appealed to for answers to any definite questions which depend upon the sequence of meteorological conditions in the Eastern Counties, and questions that suggest themselves upon glancing at the tables themselves are for the most part prompted by mere curiosity, and tend in the direction of looking for records. I shall therefore permit myself only a few general remarks, and not spend much time over record results. The general course of the average seasons in the Eastern Counties is indicated by the figures representing the weekly averages for the twenty years 1881 to 1900, and runs more or less similarly to the curves for the wheat-producing districts in the diagram, pp. 288 and 289 (fig. 3). The most rainy week on the average is the forty-first, about the beginning of October, with 0·75 inch of rain, as against 0·77 in the average for the wheat-producing districts for the same week. The driest week is the eleventh, about the second week in March, with 0·21 inch, which is substantially drier than the same week (also the driest week) for the wheat-producing districts, which has 0·29 inch.

For sunshine the twenty-second week, the last week in May, has on the average a duration of fifty-three hours, nearly an hour a day longer than the maximum duration for the whole eastern side; the least sunny week, the second week in January, does not differ much from that for the larger area. In accumulated temperature above 42° a total of 129 is reached on the average for two weeks in August, and though this is 6 day-degrees above the maximum figure for the eastern side of our islands, and 10 day-degrees above the maximum for the western side, it is still 10 day-degrees short of the maximum for the Channel Islands.

Below 42° F. the greatest average accumulation is, as in all four of the regions represented in the diagram of pp. 288 and 289, in the first week of the year, and England E. shows 49·2 day-degrees, or 5 more than the average for the wheat-producing districts, and the whole accumulation of "cold" for the winter quarter is 504, nearly 50 day-degrees more than the figure for the whole eastern side of the kingdom as shown in the diagram.

I will add a few notes about "records":—

The driest spring was in 1893, with a rainfall of 1·20 inches.

The wettest spring was in 1878, with a rainfall of 7·55 inches.

The driest summer was in 1885, with a rainfall of 3·63 inches.

The wettest summer was in 1879, with a rainfall of 12·99 inches.

The driest autumn was in 1904, with a rainfall of 3·80 inches.

The wettest autumn was in 1885, with a rainfall of 12·63 inches.

The driest winter was 1890-91, with rainfall of 2·68 inches.

The wettest winter was 1899-1900, with rainfall of 8·25 inches.

The longest continuous period of relatively dry weather was in 1893, when the rainfall was below the mean for fifteen consecutive weeks, for six of which no rain is entered. There is no corresponding spell of relatively wet weather, the longest indicated in the table being one of eight weeks in the summer of 1880; but in 1879 there was a long run of nineteen weeks with more than their average of rainy days, extending from early spring to the end of July, and continued, with a break of a single week, for eight more weeks up to the end of September.

The longest spells of sunny weeks were in the summer of 1887 and the spring of 1893; but in 1904, from the beginning of summer to the close of the year, sunshine was very abundant, there being only eight weeks out of the thirty with a record below the average.

The longest period of hot summer weather was for twelve weeks in 1899; the hottest week was the thirty-third week of 1893, with 193 day degrees, but the thirtieth week of 1900 is a good second, with 190 day degrees.

The most prolonged period of cold was for fourteen weeks in the autumn and winter of 1878, but the coldest week was the sixth week of 1895, which occurred in a run of eight weeks of exceptionally cold weather in that year or the second week of 1880. The amount of accumulated temperature below 42° F. in each of the weeks referred to was 132 day degrees, and would correspond with a mean temperature for the week of 23° F.

The Succession of Seasons.

The next table (Table VII) gives a summary of the seasonal values of Table VI for the separate years, and is intended as a meteorological *calbre* exhibiting the sequence of the seasons year after year, in such a manner as to make as easy as possible the comparison of the meteorological data with each other and with those of other phenomena more or less dependent on the weather. To illustrate the possibilities of this method of dealing with various problems of this kind, the statistics of a number of phenomena derived from various sources have been included in the table.

TABLE VII.—THE SUCCESSION OF SEASONS
Compiled from the Weekly Values of Table VI, with Phenological Data

Average.				England E.	1884-5.				1885-6.			
W.	Sp.	Sum.	Au.		W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
5.29	4.89	6.80	7.59	Rainfall: Difference from average, in inches	+1.33	+0.96	-3.17	+5.04	-0.56	+0.59	-0.90	-0.67
—	—	—	—	Number of weeks <i>below</i> average	6	8	12	3	8	7	9	9
50	41	41	49	Rain-days: Difference from average	+ 7	0	- 14	+ 13	+ 2	+ 6	- 3	- 3
—	—	—	—	Number of weeks <i>below</i> average	3	7	10	2	8	5	7	6
176	499	580	308	Sunshine: Difference from average, in hours	- 60	0	- 13	- 22	- 3	- 85	+ 16	+ 18
—	—	—	—	Number of weeks <i>above</i> average	3	7	6	4	8	5	7	7
				Accumulated Temperature:—								
				Above 42° F.								
126	599	1565	746	Difference from average, in Day-degrees	+ 46	-104	- 89	-146	- 86	- 49	- 60	+221
—	—	—	—	Number of weeks <i>above</i> average	6	3	3	1	2	5	4	11
				Accumulated Temperature:—								
				Below 42° F.								
504	192	0	96	Difference from average, in Day-degrees	-104	+ 62	0	+ 1	+162	+ 33	0	- 48
—	—	—	—	Number of weeks <i>above</i> average	5	9	—	5	9	4	—	1
38.0	46.3	61.4	50.4	Earth Temperature:—								
42.0	45.6	57.8	53.3	At 1 foot depth	+0.9	0	+0.8	+1.4	-1.5	-1.2	-0.5	+2.1
—	—	—	—	At 4 feet depth	+0.4	+0.4	+0.8	-1.6	-1.2	-1.2	-0.3	+1.3
27	8	2	21	Fogs: Number of days of Fog in London	18	14	5	25	33	16	8	28
6.4	3.3	0.6	5.5	Gales: Number of Gales reported on East Coast	10	1	0	7	3	5	0	6
—	584	—	—	Sea Casualties, reported in 12 months ending June 30	—	422	—	—	—	442	—	—
—	—	—	34	Storm Warnings: Number issued to East Coasts in 12 months ending December 31st	—	—	—	59	—	—	—	38
				Phenological Data:—								
				First flowering of—								
—	125	—	—	Forest Trees: (Horse Chestnut)	—	—	—	—	—	—	—	—
37	131	157	264	Shrubs: (Hazel, Hawthorn, Dog-rose, Ivy)	—	—	—	—	—	—	—	—
61	146	190	—	Herbs: (Coltsfoot, White Ox-Eye, Greater Bindweed)	—	—	—	—	—	—	—	—
—	—	217	—	Beginning of Corn Harvest	—	—	—	—	—	—	—	—
				Yield of Crops:								
—	—	30.8	—	Wheat (per acre, in bushels)	—	—	33.8	—	—	—	29.2	—
—	—	33.4	—	Barley: (per acre, in bushels)	—	—	37.6	—	—	—	34.5	—
—	—	26.6	—	Beans: (per acre, in bushels)	—	—	19.6	—	—	—	28.2	—
—	—	—	6.0	Potatoes: (per acre, in tons)	—	—	—	6.0	—	—	—	6.3
—	—	—	11.9	Turnips and Swedes, (per acre, in tons)	—	—	—	10.1	—	—	—	14.4
				Deaths:								
—	—	—	—	All causes, per million persons	—	—	—	—	—	—	—	—
				Zymotic diseases:								
—	—	—	—	Small Pox, per million persons	—	—	—	—	—	—	—	—
—	—	—	—	Measles " "	—	—	—	—	—	—	—	—
—	—	—	—	Scarlet Fever " "	—	—	—	—	—	—	—	—
—	—	—	—	Diphtheria " "	—	—	—	—	—	—	—	—
—	—	—	—	Whooping Cough " "	—	—	—	—	—	—	—	—
—	—	—	—	Fever " "	—	—	—	—	—	—	—	—
—	—	—	—	Diarrhoea " "	—	—	—	—	—	—	—	—
—	—	—	—	Cholera " "	—	—	—	—	—	—	—	—
—	—	—	—	Under 1 year, per 1,000 Births	—	—	—	—	—	—	—	—

TABLE VII.—THE SUCCESSION OF SEASONS
Compiled from the Weekly Values of Table VI, with Phenological Data

	1890-1.				1891-2.				1892-3.			
	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
ENGLAND E.												
Rainfall	-2·61	+1·02	+1·31	+0·63	-0·16	-0·31	+1·87	+2·60	+0·63	-3·69	-0·58	-0·73
Dry weeks... ..	11	7	5	7	7	8	5	6	6	13	7	8
Rain-days	-18	+11	+7	+9	+2	0	+2	+3	+4	-25	+1	+2
Fair weeks	9	4	5	4	5	6	7	5	4	11	6	6
Sunshine	+34	-104	-104	+10	-10	+70	-27	-59	-14	+189	+45	+47
Sunny weeks	8	3	3	6	8	8	5	5	4	10	9	9
Temperature above 42° F.	-9	-143	-96	+56	-20	+35	-147	-153	-28	+260	+179	-28
Warm weeks	4	4	5	8	4	5	5	1	4	12	9	5
Temperature below 42° F.	+276	+49	0	-7	+126	+115	+3	-1	+101	-55	0	+40
Chilly weeks	9	7	—	2	7	8	—	5	6	3	—	5
Earth Temp: 1 foot ...	-3·0	-2·2	-2·1	+0·4	-0·8	-2·0	-1·9	-1·6	-1·5	+2·3	+0·5	-1·7
„ 4 feet	-2·0	-1·4	-1·8	-0·1	-0·5	-1·3	-1·3	-1·6	-1·3	+1·8	+0·7	0
Fogs	50	5	2	20	27	10	1	27	24	9	0	5
Gales	3	7	1	7	8	2	2	4	4	0	0	4
Sea Casualties	—	444	—	—	—	589	—	—	—	401	—	—
Storm Warnings	—	—	—	22	—	—	—	23	—	—	—	25
Trees	—	+14	—	—	—	+11	—	—	—	-16	—	—
Shrubs	+7	+13	+14	+8	-3	+10	+3	+3	+1	-19	-22	-18
Herbs	-4	+12	+27	—	+1	+5	+8	—	-5	-16	-21	—
Date of Harvest	—	—	+12	—	—	—	+11	—	—	—	-9	—
Wheat	—	—	33·5	—	—	—	26·0	—	—	—	25·2	—
Barley	—	—	36·0	—	—	—	35·4	—	—	—	26·3	—
Beans	—	—	31·0	—	—	—	18·9	—	—	—	19·3	—
Potatoes	—	—	—	6·4	—	—	—	6·5	—	—	—	6·7
Turnips	—	—	—	13·1	—	—	—	13·5	—	—	—	9·6
Deaths:—	1891				1892				1893			
All causes, per million persons	5029	4875	3562	4131	6779	3989	3669	3885	4453	3929	4329	4464
Zymotic diseases:												
Small Pox, per million persons	2	0	0	0	0	2	0	0	5	10	20	9
Measles „ „	98	82	23	49	33	99	95	110	86	40	20	54
Scarlet Fever „ „	16	11	15	25	18	22	27	45	36	52	62	62
Diphtheria „ „	59	55	51	105	70	60	71	98	82	89	104	158
Whooping Cough, „ „	108	99	103	84	131	105	59	43	70	54	92	119
Fever „ „	37	23	36	54	24	34	31	36	21	27	73	68
Diarrhœa „ „	44	40	148	75	36	39	293	54	41	80	568	70
Cholera „ „	0	0	3	2	0	0	9	1	0	3	18	2
Under 1 year, per 1,000 Births ...	142	119	117	130	159	113	142	122	122	109	181	129

Note.—The vital statistics

IN DISTRICT 3 (ENGLAND EAST)—Contd.

and other Statistical Results for Seasons, taken from Various Sources.

1893-4.				1894-5.				1895-6.				1896-7.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
-0.50	+0.82	+1.13	+0.31	+0.39	-0.71	+1.38	-0.85	-1.85	-0.20	-1.35	+1.90	+2.50	+0.14	-0.90	-2.45
7	6	7	8	8	7	7	7	10	7	10	5	5	6	7	9
+ 3	+ 5	+ 10	+ 4	+ 4	- 5	- 4	- 7	- 10	+ 4	- 4	+ 7	+ 13	+ 2	- 3	- 12
4	5	4	5	4	8	9	7	10	5	6	5	1	4	8	8
+ 51	+ 7	- 96	- 54	+ 4	+ 16	+ 53	+ 73	- 21	- 35	+ 31	- 46	- 33	+ 3	+ 81	- 13
9	7	3	4	4	7	8	8	5	7	7	5	4	6	9	6
+ 44	+ 36	- 67	- 27	- 69	+ 62	+ 15	+ 113	- 4	+ 33	+ 63	- 72	- 25	+ 14	+ 110	- 58
7	8	6	6	3	9	8	8	4	7	6	5	2	5	9	5
- 15	- 75	0	- 38	+ 280	- 26	0	- 7	- 90	- 75	0	+ 82	- 9	- 42	0	- 3
5	3	—	2	9	3	—	2	4	4	—	5	5	3	—	3
-0.2	0	-2.8	-1.3	-3.7	-1.7	-0.7	+0.8	+1.2	+2.7	+1.6	-2.0	-0.1	+0.3	+1.7	+0.2
+0.3	+1.5	-0.7	-0.6	-0.9	-0.6	0	+0.6	+1.1	+1.6	+0.8	-1.5	-0.6	+0.5	+0.4	0
21	7	4	17	21	7	0	22	24	4	0	15	17	3	2	23
12	1	0	4	9	3	0	7	6	5	0	6	6	5	2	2
—	756	—	—	—	679	—	—	—	625	—	—	—	720	—	—
—	—	—	22	—	—	—	32	—	—	—	21	—	—	—	22
—	- 17	—	—	—	- 3	—	—	—	- 6	—	—	—	- 1	—	—
- 10	- 20	- 9	+ 3	+ 35	+ 2	- 2	- 10	- 15	- 10	- 6	- 2	- 1	- 2	- 2	- 2
- 12	- 8	+ 2	—	+ 17	- 6	- 8	—	0	- 6	- 12	—	- 7	- 2	- 5	—
—	—	+ 1	—	—	—	- 4	—	—	—	- 12	—	—	—	0	—
—	—	31.1	—	—	—	27.7	—	—	—	34.4	—	—	—	28.5	—
—	—	35.3	—	—	—	31.6	—	—	—	34.9	—	—	—	33.1	—
—	—	30.3	—	—	—	23.3	—	—	—	25.6	—	—	—	28.8	—
—	—	—	6.2	—	—	—	7.3	—	—	—	6.0	—	—	—	5.7
—	—	—	13.2	—	—	—	10.5	—	—	—	10.9	—	—	—	13.4
1894				1895				1896				1897			
4887	3602	3262	3574	5003	3994	4137	4043	4125	3442	3735	3923	4094	3530	4042	4026
26	13	1	0	0	0	2	4	0	0	0	0	0	0	0	0
37	132	71	37	53	107	116	145	148	127	72	33	24	35	33	74
29	25	21	25	15	16	26	32	23	19	27	21	23	16	21	16
130	82	101	158	85	77	104	141	93	75	82	99	60	43	51	96
109	108	84	67	83	54	52	60	117	116	85	46	84	62	70	74
32	22	35	53	28	23	40	66	37	22	57	41	20	15	51	96
26	31	162	44	43	47	548	143	31	38	381	50	43	35	612	56
0	1	5	0	0	1	21	6	0	0	11	0	0	0	32	2
137	112	123	111	140	114	187	136	132	105	165	126	120	105	197	124

are for calendar quarters.

TABLE VII.—THE SUCCESSION OF SEASONS IN
Compiled from the Weekly Values of Table VI, with Phenological Data

	1897-8.				1898-9.				1899-1900.			
	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
ENGLAND, E.												
Rainfall	-1·29	+0·54	-1·63	-2·36	+0·43	+0·66	-2·78	+0·24	+2·96	-1·19	+0·16	-2·76
Dry weeks... ..	8	6	7	11	6	7	10	7	3	10	7	9
Rain-days	- 7	+ 5	- 10	- 13	- 2	+ 2	- 14	- 11	+ 11	- 6	+ 2	0
Fair weeks	6	4	8	9	7	6	10	8	3	8	5	6
Sunshine	+ 2	- 60	- 15	+ 49	+ 92	+ 19	+144	+ 65	- 13	- 17	+ 93	+ 49
Sunny weeks	6	4	5	6	9	6	9	8	5	6	7	9
Temperature above 42° F.	+ 71	- 68	+ 2	+244	+139	- 21	+201	+ 99	- 36	-102	+167	+112
Warm weeks	9	4	6	10	10	6	12	8	2	3	10	8
Temperature below 42° F.	-176	- 6	0	- 46	-209	+ 3	0	- 45	+ 22	+ 13	0	- 59
Chilly weeks	3	5	—	1	2	4	—	2	6	5	—	0
Earth Temp.: 1 foot ...	+2·3	+0·2	+0·2	+3·2	+2·9	+0·7	+3·2	+0·7	-0·1	+0·1	+1·9	+1·5
„ „ 4 feet	+1·9	+0·2	-0·4	+2·7	+2·6	+0·9	+1·8	-1·5	+0·5	-0·2	+0·7	+1·3
Fogs	25	9	1	19	18	8	2	18	21	3	0	0
Gales	5	5	1	5	8	2	0	7	8	5	2	2
Sea Casualties	—	719	—	—	—	566	—	—	—	497	—	—
Storm Warnings	—	—	—	24	—	—	—	19	—	—	—	18
Trees	—	+ 3	—	—	—	+ 7	—	—	—	+ 4	—	—
Shrubs	- 14	- 1	+ 5	+ 3	- 1	+ 4	+ 3	- 2	+ 6	+ 4	+ 5	+ 7
Herbs	- 10	+ 2	+ 6	—	- 4	+ 3	+ 5	—	+ 10	+ 6	+ 5	—
Date of Harvest	—	—	+ 6	—	—	—	- 4	—	—	—	- 1	—
Wheat	—	—	36·3	—	—	—	34·2	—	—	—	27·5	—
Barley	—	—	35·1	—	—	—	34·5	—	—	—	30·6	—
Beans	—	—	30·6	—	—	—	30·3	—	—	—	27·8	—
Potatoes	—	—	—	6·0	—	—	—	5·9	—	—	—	4·9
Turnips	—	—	—	11·0	—	—	—	8·9	—	—	—	13·5
Deaths :												
All causes, per million persons	4536	3511	4208	3932	4197	3709	4376	4330	5410	3918	3980	3640
Zymotic diseases :												
Small Pox, per million persons	0	0	0	0	0	0	0	0	1	0	0	0
Measles „ „	82	77	74	76	108	69	30	65	62	65	47	30
Scarlet Fever „ „	15	15	13	27	19	13	8	15	16	5	7	14
Diphtheria „ „	80	50	81	91	95	78	73	113	92	65	75	114
Whooping Cough „ „	105	107	80	66	124	95	71	56	84	120	114	70
Fever „ „	36	26	49	89	37	28	45	90	31	31	45	5
Diarrhoea „ „	30	27	692	179	30	44	838	53	30	36	579	11
Cholera „ „	0	0	33	2	1	0	32	1	0	1	13	
Under 1 year, per 1,000 Births ...	133	110	215	137	126	105	244	124	140	119	197	12

Note.—The vital statist.

DISTRICT 3 (ENGLAND EAST)—Contd.

and other Statistical Results for Seasons, taken from Various Sources.

1900-1.				1901-2.				1902-3.				1903-4.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
-0.42	+0.17	-2.66	-2.81	+0.78	+0.43	+0.83	-3.33	-0.83	+0.51	+5.03	+1.37	+0.68	-1.04	-1.56	-3.79
8	6	8	10	9	6	7	10	7	7	5	7	5	10	10	11
+ 1	+ 4	- 14	- 13	- 7	+ 9	+ 3	- 9	- 9	0	- 1	+ 8	+ 3	- 2	- 8	- 15
7	6	8	6	10	4	8	8	9	7	6	3	5	8	8	8
- 5	+ 57	+154	+ 39	+ 34	- 39	+ 13	+ 9	0	0	- 62	- 40	- 56	- 53	+129	+ 49
8	6	10	8	8	3	5	8	6	7	6	4	4	5	10	10
+ 43	- 45	+ 71	+ 79	+ 8	- 51	-121	+ 37	+128	+ 34	- 85	+ 19	- 76	+ 26	+ 91	- 6
6	4	10	7	5	8	5	9	9	10	3	7	2	7	7	5
- 87	- 2	0	+ 13	- 5	- 15	0	- 44	-214	- 66	0	- 4	- 93	- 77	0	+ 9
5	6	—	3	7	4	—	1	3	2	—	3	3	2	—	3
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	0	0	25	22	8	1	15	11	3	0	11	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	488	—	—	—	540	—	—	—	531	—	—	—	—	—	—
—	—	—	22	—	—	—	26	—	—	—	34	—	—	—	—
—	+ 5	—	—	—	+ 5	—	—	—	+ 2	—	—	—	—	—	—
+ 2	+ 9	- 1	+ 2	- 12	+ 8	+ 12	+ 11	- 5	- 6	- 2	+ 5	—	—	—	—
+ 4	- 1	- 8	—	+ 11	+ 6	+ 6	—	- 4	- 2	+ 13	—	—	—	—	—
—	—	- 3	—	—	—	+ 6	—	—	—	+ 9	—	—	—	—	—
—	—	31.8	—	—	—	33.4	—	—	—	30.4	—	—	—	25.2	—
—	—	30.3	—	—	—	35.6	—	—	—	32.3	—	—	—	29.6	—
—	—	23.9	—	—	—	30.5	—	—	—	30.6	—	—	—	22.7	—
—	—	—	6.0	—	—	—	4.7	—	—	—	4.2	—	—	—	5.3
—	—	—	10.3	—	—	—	14.3	—	—	—	9.8	—	—	—	11.6
1901				1902				1903				1904			
4209	3523	3932	3896	4294	3539	3183	3686	3765	3236	3151	3628	4120	3210	3949	3668
0	0	1	14	66	79	9	2	0	5	0	0	0	1	0	1
29	76	82	121	47	36	51	57	58	88	45	50	127	129	50	58
7	12	16	26	20	12	17	32	23	21	16	9	16	17	17	20
113	64	72	95	66	55	51	63	54	32	45	44	44	27	23	54
107	79	61	43	58	71	82	74	101	78	58	56	109	85	67	42
34	23	39	49	22	31	57	43	20	16	23	41	20	12	24	28
27	36	695	92	33	30	196	104	31	41	243	126	39	29	896	46
0	1	5	1	0	0	0	0	—	—	—	—	—	—	—	—
125	105	195	135	130	107	119	121	113	96	114	131	126	95	208	168

are for calendar quarters.

The primary meteorological data which summarise Table VI are:—

Rainfall.—1. The average for each season for twenty years, and the excess or defect of each successive season from the average.

2. The number of “dry weeks” as defined on p. 271.

Rain days.—3. The average number of rain-days for each season for the twenty years, and the excess or defect from the average in each successive season.

4. The number of “fair weeks” in each season as defined on p. 271.

Sunshine.—5. The average number of hours recorded for each season for the twenty years, and the excess or defect in hours from the average for each successive season.

6. The number of “sunny weeks” as defined on p. 271.

Accumulated Temperature above 42° F.—7. The average number of day degrees for each of the four seasons for the twenty years, and the excess or defect from the average in each successive season.

8. The number of “warm weeks” as defined on p. 271.

Accumulated Temperature below 42° F.—9. The average number of day degrees for each of the four seasons for the twenty years, and the excess or defect from the average in each successive season.

10. The number of “chilly weeks” as defined on p. 271.

To these primary meteorological data some additions have been made. A table of seasonal average values of earth temperatures at 1 foot and 4 feet depth has been compiled for England E., using for this purpose the monthly data for two stations, Lowestoft and Aspley Guise, extracted from the “Meteorological Record.” The values for 1 foot (line 11 of the table) extend from 1881 to 1900 inclusive, those for 4 feet (line 12) from 1883 to 1900. The table stops short at the last-mentioned year, as the data for Aspley Guise cease then, and I have thought it better to limit the figures quoted to the years for which the two stations run concurrently rather than attempt to complete the table by substituting values from some other station for the last four years. Values are now given in the Registrar-General’s report, and these could be used for 1903 and 1904, but they would not be, strictly speaking, a continuation of those for the twenty years mentioned.

The further meteorological data are the number of gales on the

East coast (line 13), taken from Mr. F. J. Brodie's paper in the "Quarterly Journal of the Royal Meteorological Society" (vol. 29, p. 151), and the number of observations of fog recorded at the Brixton station of the Meteorological Office, taken from a paper by the same author.⁴

Statistics of other Phenomena.

As most closely connected with the work of the Meteorological Office, it would be interesting to bring into juxtaposition comparable data for the number of casualties at sea due to the weather, and the number of storm warnings issued by the Office, but I have been unable to find the data for a satisfactory comparison. For such a purpose we should require the casualties for all vessels on or near the coasts of the British Isles, classified according to their causes and according to the divisions of the coast. The table in the wreck returns of the Board of Trade which comes nearest to satisfying the conditions is Table 57 (p. 61 of the Return for 1903), but this gives the total casualties, and does not distinguish those attributable to the weather from those due to other causes. Moreover, the Board of Trade year for this purpose ends with 30th June, and does not coincide in this respect either with the harvest year adopted in the table or with the calendar year. However, as it seems desirable to have the comparative figures in the table, the total sea casualties for the coast from Flamborough Head to the North Foreland have been taken out for each year from the Board of Trade returns, the casualties due to collisions being excluded; and, as a matter of interest in this connection, the number of storm warnings issued to the East Coast district from the Meteorological Office in each year, ending in this case with 31st December, has been taken from the annual reports of the Meteorological Council.

These supplementary meteorological statistics and the associated Board of Trade figures are given in lines 13 to 16 of the table.

Agricultural Data.

When I decided to compile the table in the shape in which it now appears, I intended to incorporate in it such agricultural statistics as were immediately available, without special compilation, for the purpose of comparison, and for this reason I commenced with the preparation of a table for the "wheat-producing districts;" but it soon became apparent that although such a table might be used for

⁴ "Quarterly Journal of the Royal Meteorological Society," vol. 31, p. 15, 1905.

comparison with the agricultural statistics regarding wheat for England as given in the statistical tables of the Board of Agriculture, it was less and less appropriate for the other crops in succession, and, indeed, the only really common area for the two bodies of statistics was the United Kingdom. It would probably be allowed on all sides that this is too large an area for the purpose of effective comparison. I therefore thought it best to limit myself to one district, even though it involved the compilation of the data from the county values given in the agricultural returns. I chose accordingly district 3, England E., and computed the average yield per acre of five principal crops—wheat, barley, beans, potatoes and turnips and swedes—from the official statistics.⁵ The counties to which the data refer are indicated in the map of p. 261. I had already taken out certain phenological data for plants from Mr. Mawley's reports contributed to the Royal Meteorological Society and published in their *Quarterly Journal*. These are also included in the table, lines 17 to 20, and the crop yields follow them, lines 21 to 25.

Phenological Data.

For the phenological data I have gone upon the principle of distinguishing between forest trees, shrubs and herbs, and have selected from Mr. Mawley's data those of a representative plant of each kind for each season in so far as that was possible. I have also taken from Mr. Mawley's report the date of the commencement of the corn harvest. To represent the statistical results for these phenomena I have taken the average of the dates, represented by the number of days from the commencement of the year, for the twelve years 1891-1902, the latest of the averages given in Mr. Mawley's reports, and have given these values, together with the differences in days for each plant, and for the commencement of the corn harvest, from the twelve years' average for each successive season. These differences are entered in the appropriate columns. The early occurrence of the phenomenon is indicated by the minus sign -; the late occurrence by the + sign. Thus + 14 against the horse chestnut in the spring of 1891, means that in that year the flowering of the tree was fourteen days late, while - 17 in the spring of 1894, means that in the latter year the flowering took place seventeen days earlier than the average.

⁵ "Report on the Agricultural Returns . . . in Great Britain. Annual "Returns of Acreage and Live Stock."

Yield of Crops.

For the yield of crops the averages for the twelve years 1891-1902 are also given, and the actual value for each year. The figures for wheat, barley, and beans represent bushels per acre, those for potatoes and turnips tons per acre. For all practical purposes of this paper the averages for the period of twelve years mentioned are identical with the averages for the nineteen years for which the data are available.⁶

Vital Statistics.

Finally, I have added a number of mortality statistics from the Quarterly Returns of the Registrar-General of births, deaths, and marriages for England and Wales. In this case also the statistics are not quite on all fours with the meteorological data. The Registrar-General gives his information for the calendar quarters and for his own districts. Moreover, he only gives in the quarterly returns the gross totals of deaths in the districts, deaths from the specified diseases, deaths of infants and of old people; also not one of the Registrar-General's districts coincides with a meteorological district; but his eastern counties, which comprise Norfolk, Suffolk, and Essex, are completely enveloped by the meteorological district. England E. and the meteorological conditions are not likely as a general rule to be seriously different. I have therefore taken out the mortality from the various causes indicated for each quarter, and, at the suggestion of Dr. Tatham, have computed the mortality of infants under 1 year per thousand births, while the other values are the crude ratios of deaths per million of the gross population of the district uncorrected for variation of age-constitution. It has been necessary to extract the returns from the quarterly reports because, so far as I have been able to ascertain, the annual tables group together either the seasons or the areas, and I have not found a separate table for individual areas. The difficulty of the difference of the quarters is insuperable so far as this table is concerned, but the meteorological data for districts for the calendar

⁶ The averages for the two periods are as follows, the figures being given in bushels per acre or tons per acre, as the case may be:—

	Wheat.	Barley.	Beans.	Potatoes.	Turnips.
Average for twelve years } 1891-1902.....	30·8	33·4	26·6	6·0	11·9
Average for nineteen years } 1885-1903.....	31·0	33·5	27·1	5·9	11·8

quarters are given in a quarterly supplement to the "Weekly Weather Report" for those who require them.

In Table VII the Registrar-General's statistics for the first quarter (January to March) have been put under the winter quarter (December to February), and so on. This has some show of reason, for the registration of deaths would certainly occur at some considerable time later than any variation of meteorological conditions with which the deaths might be associated.

It may be admitted that the table thus completed is in some respects unsatisfactory, but it seemed desirable to put together in a single table available statistics derived from various sources, to serve as an index of such data for the guidance of those who may be desirous of examining the seasonal sequences of various phenomena which depend, in part at least, upon the weather.

In so far as the data here collected are not in a form suitable for carrying out such a comparison the result may be merely an argument in favour of co-ordination, where co-ordination is necessary, but as regards the agricultural and phenological data the table has obvious possibilities, and one only regrets the absence of data for the earlier years.

Some Applications of Table VII.

It is, perhaps, needless to remark that a complete analysis of the information to be derived from the comparison of the figures actually given would be altogether beyond the limits of a single paper, and I cannot do more than allude to a few of the lines of inquiry suggested by the juxtaposition of the figures. As I have already said with reference to Table VI, the compilation is intended to answer definite questions put to it, and I can best indicate its purpose by considering one or two questions.

Commencement of Harvest.

Take for example the relation between the commencement of the corn harvest and the accumulated temperature above 42° F. I take out the figures for the successive years:—

TABLE A.

Year.	Beginning of Harvest.	Accumulated Temperature above 42° F.			
		Winter.	Spring.	Summer.	Total Spring and Summer.
1891 ...	12 days late	- 9	- 143	- 96	- 239
'92	11 " "	- 20	+ 35	- 147	- 112
'93	9 " early	- 28	+ 260	+ 179	+ 439
'94	1 day late	+ 44	+ 36	- 67	- 31
'95	4 days early	- 69	+ 62	+ 15	+ 77
'96	12 " "	- 4	+ 33	+ 63	+ 96
'97	Average	- 25	+ 14	+ 110	+ 124
'98	6 days late	+ 71	- 68	+ 2	- 66
'99	4 " early	+ 139	- 21	+ 201	+ 180
1900	1 day "	- 36	- 102	+ 167	+ 65
'01	3 days "	+ 43	- 45	+ 71	+ 26
'02	6 " late	+ 8	- 51	- 121	- 172
'03	9 " "	+ 128	+ 34	- 85	- 51

Considering the vagueness which must attach to the "beginning of corn harvest," the relation of the figures is rather surprising. The beginning of harvest may be delayed after corn is ripe because the weather is unfavourable for the commencement of operations. Moreover the figures for the summer include the weeks up to the thirty-fifth, and to make the investigation complete reference ought to be made to the temperature table similar to Table VI, and correction made for the superfluous weeks. But without further refinement, in every year when harvest was early, accumulated temperature from the end of February to the end of August was in excess of the average; and every year when harvest was late, the accumulated temperature, estimated in the same way, was in defect. It must be allowed that the one year when the harvest was exactly "on time" is a disturbing element.

A similar process may be pursued with regard to the relation between the flowering of the horse chestnut and the earth temperature at 4-foot depth, which gives much less concordant results, but still shows some indication of correlation.

Yield of Wheat.

One result of great interest and importance appeared in the course of the preparation of the tables. As already indicated, the work was begun for the "wheat-producing districts," and a portion of the table, extending over five years, was compiled, and the yield of wheat for England entered in the columns. By a curious accident, in the preliminary specimen sheet I entered the yields under the wrong years, and drew the conclusion that a fine summer

was the principal characteristic of a year with a large yield. The conclusion satisfied my natural instincts, and I was therefore a good deal disturbed when I found out my mistake, and had to put good yields under years without fine summers, and *vice versa*.

But it was at once apparent from the table that the years of heavy yield, though I could no longer regard them as years of abundant sunshine or of genial spring, were the years preceded by dry autumns; and this turned out to be very generally true, so much so that a dry autumn seemed necessary for an abundant yield in the following year. A similar relation for the eastern counties is exhibited also in the table now under consideration. Again I take the figures from Table VII. Suggestions have been made by different persons that the winter and spring rainfalls are important elements; I therefore transcribe them too:—

TABLE B.

Year.	Rainfall. Autumn and Winter Combined.	Yield of Wheat. Average 31.	Previous Rainfall.		
			Autumn.	Winter.	Spring.
1885	+ 1.04	33.8	— 0.29	+ 1.33	+ 0.96
'86	+ 4.48	29.2	+ 5.04	— 0.56	+ 0.59
'87	— 0.34	32.9	— 0.67	+ 0.33	+ 0.24
'88	— 2.59	31.9	— 0.92	— 1.67	+ 0.37
'89	— 3.82	29.3	— 2.22	— 1.60	+ 2.03
'90	— 1.42	31.8	— 0.69	— 0.73	— 0.01
'91	— 4.60	33.5	— 1.99	— 2.61	+ 1.02
'92	+ 0.47	26.0	+ 0.63	— 0.16	— 0.31
'93	+ 3.23	25.2	+ 2.60	+ 0.63	— 3.69
'94	— 1.23	31.1	— 0.73	— 0.50	+ 0.82
'95	+ 0.70	27.7	+ 0.31	+ 0.39	— 0.71
'96	— 2.70	34.4	— 0.85	— 1.85	— 0.20
'97	+ 4.40	28.5	+ 1.90	+ 2.50	+ 0.14
'98	— 3.74	36.3	— 2.45	— 1.29	+ 0.54
'99	— 1.93	34.2	— 2.36	+ 0.43	+ 0.66
1900	+ 3.20	27.5	+ 0.24	+ 2.96	— 1.19
'01	— 3.18	31.8	— 2.76	— 0.42	+ 0.17
'02	— 2.43	33.4	— 2.81	+ 0.38	+ 0.43
'03	— 4.16	30.4	— 3.33	— 0.83	+ 0.51
'04	+ 2.05	25.2	+ 1.37	+ 0.68	— 1.04
'05	— 5.17		— 3.79	— 1.38	....
Average	....	30.8	7.59*	5.29*	4.89*

* These averages are for the twenty years 1881-1900.

For the years when the yield of wheat was above the average the figures are printed in **clarendon** type, and the same type is used for rainfall figures below the average.

The relation between the autumn rainfall and the yield is clearly apparent; omitting 1888, 1889, 1890, and 1903, the yield goes down

as the autumn rainfall goes up, or, putting the matter in a different way, with the exception of the years 1889 and 1903, when the yield is above the average, the previous autumn rainfall is below the average and *vice versa*. The year 1886 is remarkable, because the enormous autumn rainfall was followed by a yield of only two bushels below the average. A reference to Table VI makes it seem probable that out-door farming operations were simply suspended during that season. Of the other years mentioned, 1888 had a cold soil for the previous autumn and a cold, wet summer; 1889 had also cold soil for the previous autumn, and again, on referring to Table VII, we see that the harvest season of that year was the eighth successive quarter of deficient sunshine, indicating a run of sunlessness without a parallel in the statistics of the district; 1890 is only slightly out of the regular course, and 1903 had, as is well known, a summer of specially heavy rainfall.

The addition of the winter rainfall does not apparently improve matters; the same years are again exceptional, and 1902 comes into the same category, while 1895 starts in that case with the exceptional result of a yield above the average following an excess of rainfall.

The yield pays little attention to the spring rainfall. The bad yield of 1889 certainly followed a rainy spring, but the year has already been mentioned for its lack of sunshine.

I have however already occupied your attention too long, and the further treatment of the details of the relation between the yield of wheat and rainfall requires fuller consideration than can be allowed on the present occasion.

It will thus be seen that Table VII, supplemented by the details to be obtained from Table VI, from which the meteorological statistics were compiled, does give an answer to questions which are put to it in certain cases, and I am sanguine that it will afford means of studying some important agricultural questions. In all probability its best form would be a large scale edition to be used as a wall map, so that its facts should always be available for reference without trouble. Possibly every question would need closer examination of the details, but the table would be useful as a handy index.

Season Tables for the British Isles.

The remaining tables give the meteorological summaries for the British Isles divided into four parts; the wheat-producing districts on the eastern side, the grazing districts on the western, the extreme north (Scotland N.), and the extreme south (the Channel Islands),

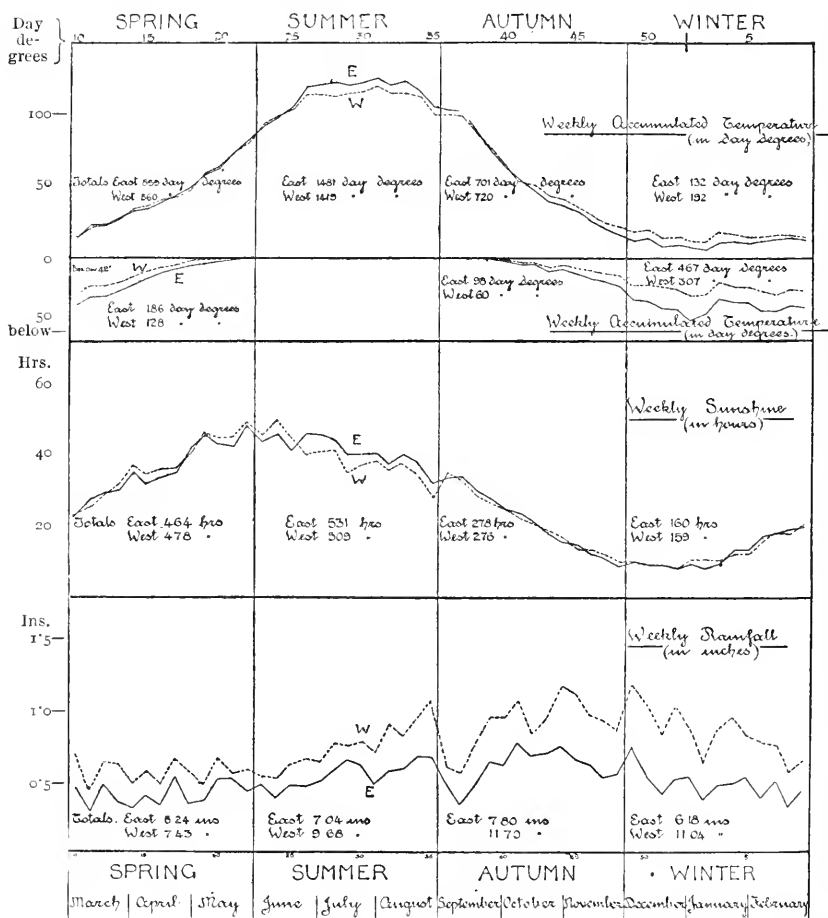
both of the latter having what may be called marine climates. The summaries are of two kinds, and are compiled from tables similar to Table VI, which are too bulky to be included in this paper. From these the weekly average values of the elements for the twenty

FIG. 3.—*The Course of the Seasons in the British Isles.*

(Weekly averages for the twenty years 1881-1900, Table VIII.)

EAST AND WEST.

Principal Wheat-Producing Districts and Principal Grazing Districts.



years 1881-1900, and the extremes which have occurred in the twenty-seven years 1878-1904, were obtained. The averages are shown in fig. 3, and the highest values are reproduced in Table VIII. The other tables, IX and X, give the summaries

FIG. 3 *Contd.*—*The Course of the Seasons in the British Isles.*

(Weekly averages for the twenty years 1881-1900, Table VIII.)

NORTH AND SOUTH.

Scotland North and Channel Islands.

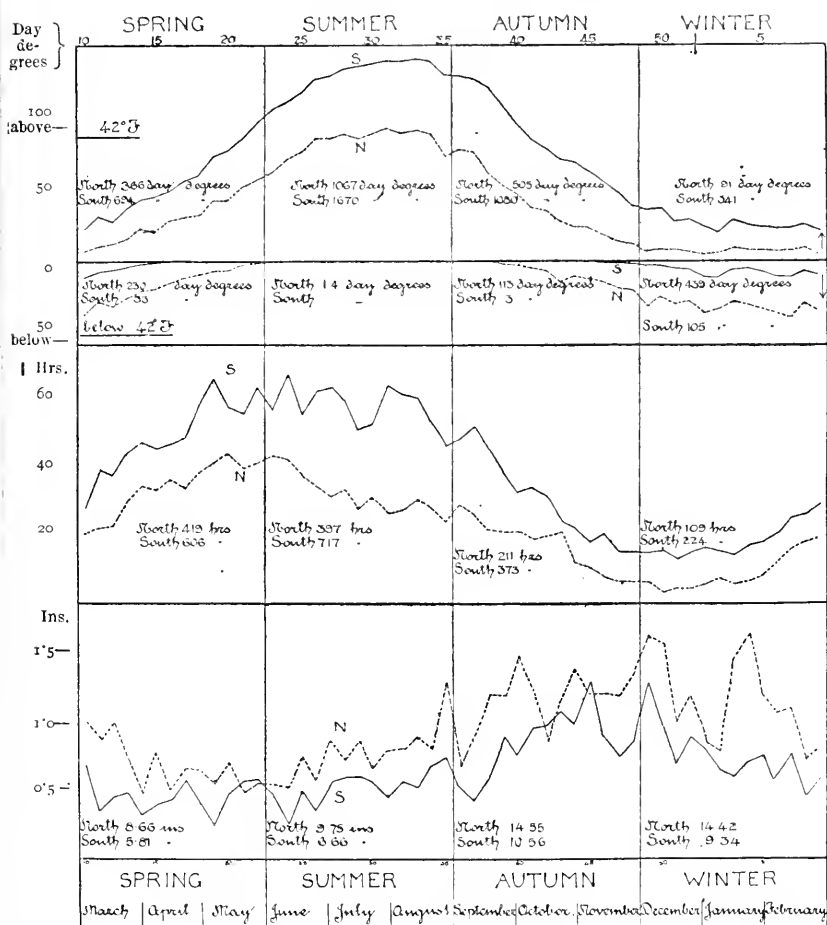


TABLE VIII.—*The Course of the Seasons in the British Isles. Summary of Results obtained from Weekly Values. The highest Value recorded in the 27 years, 1878–1904, for each successive week from the beginning of the year.*

RAINFALL, IN INCHES.

WINTER.					SUMMER.				
No. of Week from beginning of Year.	Highest (1878–1904).				No. of Week from beginning of Year.	Highest (1878–1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
	Ins.	Ins.	Ins.	Ins.		Ins.	Ins.	Ins.	Ins.
49	1·42	2·75	2·51	3·95	23	1·11	1·67	1·18	1·65
50	1·57	2·05	2·71	4·15	24	1·49	1·93	1·58	1·59
51	1·04	2·00	2·99	2·87	25	1·08	1·57	1·18	1·70
52	1·29	2·18	2·17	2·94	26	1·26	1·81	1·53	2·52
1	1·60	2·16	2·73	2·10	27	1·21	1·42	1·89	1·98
2	0·84	1·57	1·56	2·01	28	1·44	1·78	1·79	1·85
3	1·41	2·56	1·50	3·13	29	1·36	1·24	1·67	1·83
4	1·24	2·58	1·91	4·19	30	1·74	1·77	2·11	1·74
5	1·41	1·75	2·18	2·72	31	1·33	1·66	1·38	1·68
6	1·49	1·98	2·09	3·13	32	1·37	2·24	1·61	1·66
7	1·29	1·67	2·50	2·57	33	1·56	1·99	2·21	2·50
8	1·29	2·11	1·69	2·58	34	1·96	2·20	1·74	2·32
9	1·38	1·51	1·92	2·30	35	1·55	2·40	1·59	3·04
Highest Total.	9·65 (1899–0)	14·77 (1893–4)	15·10 (1899–0)	24·81 (1893–4)	Highest Total.	11·82 (1879)	14·99 (1879)	11·63 (1903)	15·48 (1903)
SPRING.					AUTUMN.				
No. of Week from beginning of Year.	Highest (1878–1904).				No. of Week from beginning of Year.	Highest (1878–1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
	Ins.	Ins.	Ins.	Ins.		Ins.	Ins.	Ins.	Ins.
10	0·97	1·89	2·33	2·94	36	1·20	2·05	1·76	2·05
11	0·95	1·71	1·17	2·90	37	1·59	2·13	2·56	2·65
12	0·89	1·54	1·42	2·39	38	1·87	1·62	2·36	3·27
13	1·01	1·48	1·66	2·43	39	1·52	2·22	1·96	3·36
14	1·07	1·47	2·01	2·88	40	1·95	1·99	2·48	5·13
15	1·19	1·63	1·13	2·15	41	1·58	2·21	2·45	2·65
16	0·97	1·38	1·67	1·49	42	2·00	2·18	2·44	2·24
17	1·31	1·34	1·48	2·10	43	1·59	2·52	3·00	2·99
18	1·25	1·19	1·21	1·81	44	1·71	2·35	1·82	4·24
19	1·25	1·22	1·24	1·42	45	1·50	2·10	2·28	2·45
20	1·67	1·82	1·18	2·20	46	1·73	2·18	3·46	2·68
21	1·17	1·60	1·41	1·30	47	1·76	1·82	2·03	3·62
22	1·46	1·36	1·60	1·64	48	1·60	1·76	2·47	3·87
Highest Total.	7·65 (1889)	9·65 (1886)	9·28 (1878)	13·58 (1904)	Highest Total.	10·79 (1880)	15·28 (1903)	16·85 (1880)	23·83 (189)

LE VIII Contd.—*The Course of the Seasons in the British Isles. Summary of Results obtained from Weekly Values. The highest Value recorded in the 27 years, 1878-1904, for each successive week from the beginning of the year.*

DAYS WITH RAIN.

WINTER.					SUMMER.				
No. of Week from beginning Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
49	6	7	7	7	23	6	6	6	7
50	6	7	7	7	24	5	6	7	7
51	6	7	7	7	25	5	6	7	7
52	6	7	7	7	26	6	6	6	7
1	6	7	7	7	27	6	7	7	7
2	5	7	7	7	28	6	7	6	7
3	7	7	7	7	29	5	6	7	7
4	6	7	7	7	30	6	6	7	6
5	7	7	7	7	31	6	6	7	7
6	7	7	7	7	32	6	6	7	7
7	6	7	7	7	33	6	7	7	7
8	7	7	7	7	34	6	7	7	7
9	6	7	7	7	35	7	7	7	7
Highest Total.	59 (1899-0)	70 (1893-4)	74 (1903-4)	79 (1893-4)	Highest Total.	62 (1879)	67 (1879)	70 (1879)	70 (1890)

SPRING.					AUTUMN.				
No. of Week from beginning Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
10	6	7	7	7	36	5	6	6	7
11	5	6	7	7	37	6	7	7	7
12	6	6	6	7	38	6	7	7	7
13	6	7	7	7	39	6	7	7	7
14	6	7	7	7	40	7	7	7	7
15	6	7	7	7	41	6	7	7	7
16	6	6	7	6	42	6	7	7	7
17	6	6	6	7	43	6	6	7	7
18	6	6	7	7	44	7	7	7	7
19	6	6	6	7	45	7	7	7	7
20	6	7	6	7	46	6	7	7	7
21	7	6	6	7	47	6	7	7	7
22	6	6	7	7	48	6	7	7	7
Highest Total.	55 (1879)	58 (1902)	62 (1878)	68 (1902)	Highest Total.	62 (1882)	66 (1903)	76 (1882)	75 (1899)

TABLE VIII Contd.—The Course of the Seasons in the British Isles. Summary of Results obtained from Weekly Values. The highest Value recorded in the 27 years, 1878-19, for each successive week from the beginning of the year.

SUNSHINE, IN HOURS.

WINTER.					SUMMER.				
No. of Week from beginning of Year.	Highest (1880-1904).				No. of Week from beginning of Year.	Highest (1880-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
	Hrs.	Hrs.	Hrs.	Hrs.		Hrs.	Hrs.	Hrs.	Hrs.
49	19	17	23	17	23	69	79	83	68
50	14	14	30	11	24	75	78	99	71
51	15	16	36	8	25	62	87	87	77
52	16	14	35	9	26	75	67	91	52
1	18	18	40	11	27	71	75	99	55
2	16	17	28	18	28	79	79	95	84
3	17	20	28	14	29	69	49	76	50
4	26	25	35	16	30	56	52	68	58
5	25	25	32	25	31	64	64	85	52
6	27	27	33	21	32	60	58	80	59
7	33	34	54	36	33	64	66	83	56
8	40	34	66	40	34	67	75	84	50
9	36	33	58	33	35	45	55	68	57
Highest Total.	213 (1886-7)	202 (1886-7)	350 (1890-1)	151 (1894-5)	Highest Total.	677 (1887)	654 (1887)	870 (1887)	511 (1880)
SPRING.					AUTUMN.				
No. of Week from beginning of Year.	Highest (1880-1904).				No. of Week from beginning of Year.	Highest (1880-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
	Hrs.	Hrs.	Hrs.	Hrs.		Hrs.	Hrs.	Hrs.	Hrs.
10	32	38	44	41	36	55	46	79	46
11	47	37	64	46	37	54	59	74	48
12	61	52	77	40	38	45	51	65	46
13	61	65	74	53	39	59	47	66	33
14	56	59	73	58	40	39	36	49	47
15	53	60	65	52	41	37	33	45	38
16	54	56	69	61	42	39	35	50	34
17	71	60	80	67	43	29	33	39	38
18	59	60	82	59	44	25	31	43	24
19	70	71	92	62	45	26	25	40	26
20	77	88	83	94	46	22	21	34	16
21	76	82	93	72	47	21	25	27	18
22	81	77	97	72	48	16	20	20	14
Highest Total.	619 (1893)	579 (1901)	847 (1893)	524 (1882)	Highest Total.	358 (1895)	339 (1895)	454 (1895)	289 (1883)

LE VIII Contd.—*The Course of the Seasons in the British Isles. Summary of Results obtained from Weekly Values. The highest Value recorded in the 27 years, 1878-1904, for each successive week from the beginning of the year.*

ACCUMULATED TEMPERATURE ABOVE 42° F. IN DAY-DEGREES.

WINTER.					SUMMER.				
No. of Week from beginning of Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
49	42	46	76	26	23	114	125	140	102
50	38	45	67	32	24	135	143	158	116
51	31	37	62	26	25	136	142	146	120
52	34	39	69	26	26	163	155	149	125
1	29	36	62	26	27	146	145	154	125
2	35	37	55	24	28	160	140	162	124
3	32	39	61	27	29	173	164	172	127
4	27	33	49	27	30	166	149	176	119
5	25	28	43	23	31	160	157	189	137
6	34	35	65	24	32	160	152	173	116
7	31	32	44	30	33	185	168	187	139
8	39	44	48	40	34	154	160	182	141
9	31	33	46	25	35	145	141	156	116
Highest Total.	252 (1898-9)	305 (1898-9)	580 (1898-9)	150 (1881-2)	Highest Total.	1711 (1899)	1681 (1899)	1980 (1899)	1359 (1899)
SPRING.					AUTUMN.				
No. of Week from beginning of Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
10	50	41	52	32	36	168	152	179	134
11	53	44	60	31	37	140	133	148	96
12	59	52	64	46	38	129	121	145	105
13	60	62	69	54	39	139	137	172	113
14	62	63	82	49	40	106	104	133	100
15	58	56	69	44	41	89	89	111	81
16	67	81	97	46	42	83	84	109	72
17	73	78	97	58	43	76	80	108	64
18	79	78	92	57	44	61	63	100	39
19	78	87	93	73	45	64	78	89	46
20	92	103	113	75	46	51	54	83	41
21	103	104	111	83	47	45	49	77	34
22	117	107	114	90	48	38	44	69	41
Highest Total.	828 (1893)	853 (1893)	1035 (1893)	585 (1893)	Highest Total.	915 (1898)	918 (1898)	1330 (1898)	663 (1898)

TABLE VIII *Contd.*—The Course of the Seasons in the British Isles. Summary of Results obtained from Weekly Values. The highest Value recorded in the 27 years, 1878-1904, for each successive week from the beginning of the year.

ACCUMULATED TEMPERATURE BELOW 42° F. IN DAY-DEGREES.

WINTER.					SUMMER.				
No. of Week from beginning of Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
49	114	78	31	83	23	1	1	—	12
50	103	83	33	70	24	3	—	—	8
51	87	67	27	69	25	—	—	—	—
52	97	59	30	76	26	—	—	—	—
1	107	74	60	95	27	—	—	—	—
2	130	108	42	123	28	—	—	—	—
3	124	107	55	95	29	—	—	—	—
4	86	74	46	69	30	—	—	—	—
5	100	78	56	116	31	—	—	—	—
6	129	98	78	109	32	—	—	—	—
7	119	91	63	95	33	—	—	—	—
8	74	60	50	71	34	—	—	—	—
9	74	56	36	67	35	—	—	—	4
Highest Total.	801 (1878-9)	585 (1894-5)	327 (1894-5)	726 (1894-5)	Highest Total.	3 (1892)	1 (1881)	—	12 (1881)

SPRING.					AUTUMN.				
No. of Week from beginning of Year.	Highest (1878-1904).				No. of Week from beginning of Year.	Highest (1878-1904).			
	E.	W.	S.	N.		E.	W.	S.	N.
10	75	60	36	100	36	2	1	—	7
11	68	56	41	79	37	3	2	—	6
12	75	51	29	86	38	5	0	—	6
13	60	51	28	82	39	4	1	—	13
14	41	36	22	42	40	30	13	—	27
15	40	35	7	51	41	33	18	—	29
16	35	24	6	45	42	21	17	—	31
17	31	22	1	32	43	36	32	—	38
18	22	13	—	33	44	37	30	4	38
19	20	17	—	31	45	34	35	0	38
20	15	14	—	18	46	52	39	9	36
21	14	12	—	20	47	61	48	9	71
22	5	1	—	13	48	57	42	23	68
Highest Total.	297 (1892)	210 (1892)	95 (1883)	354 (1891)	Highest Total.	182 (1887)	129 (1896)	23 (1890)	212 (1886)

for successive years. The manner of constructing the latter tables (IX and X) is exactly similar to that employed for Table VII, and the form of presentation is also similar. The only data which have been added are those for gales in all cases, the phenological data for the wheat-producing districts, and the yield of wheat for England. The last-mentioned will enable those who wish to do so to trace the influence of the rainfall of autumn, winter, or spring upon the fluctuations of the yield for the larger area. The question has been already referred to in the "Times" of 7th February, 1905, and in the "Proceedings of the Royal Society" for 2nd February, 1905.

The weekly averages of the original form of Table VIII have been plotted in fig. 3, in order to represent diagrammatically the course of the seasons in the four component parts of the British Isles. The curves for the four parts have been grouped together two and two, so as to bring out their relative characteristics. For the sake of brevity the *principal wheat-producing districts*, which cover practically the country to the east of the line of mean rainfall, have been referred to as "East;" the *principal grazing districts*, which comprise Ireland, Wales, England N.W. and S.W., and Scotland W., have been referred to as "West," and to exhibit the analogies and contrasts between the results for the two sides, the curves for these two have been placed in juxtaposition.

A corresponding contrast has been made between north, as represented by the averages for Scotland N., and south, as represented by those for the Channel Islands, and their pairs of curves are likewise in juxtaposition.

The diagram shows a number of interesting points.

In the weekly rainfall curves the irregular transition from a minimum in spring to a maximum in autumn is clearly brought out. It is most conspicuous in "North" and "South," least so in "East," and for that group of districts the winter rainfall is comparatively small. For the North the minimum rainfall obviously occurs at the close of spring and beginning of summer, and the maximum at the close of autumn and beginning of winter; whereas in the East the minimum is in the middle of spring and the maximum in the middle of autumn.

One cannot fail to remark the considerable surges in the course of the rainfall brought out by plotting the weekly, as distinguished from the monthly, values. They are conspicuous in all the curves, and particularly so in that for Scotland N., where four great flushes of rain are shown, culminating in the thirty-fifth week, the fortieth, the forty-ninth week, and the fourth week of the new year. As the curves represent averages of twenty years, these

marked fluctuations can hardly be classed as accidental; they may fairly be regarded as corresponding with some definite meteorological sequence, although no meteorological cause can at present be assigned for them. Although they are most conspicuous in the North, they are sufficiently evident in the other curves, and in some cases there are similar fluctuations shown simultaneously over the whole country. The heavy rainfall at the end of summer, and the drop at the beginning of autumn, afford a case in point, and the flush of rainfall at the commencement of winter is equally marked. On the other hand, as between North and South an increase of rainfall in the South at the end of spring finds no counterpart, but even the reverse, in the North, and there is a corresponding want of parallelism in the middle of autumn. The curves for North and South cross each other at both these periods; otherwise, as regards rainfall, North is distinctly above South.

East and West show a distinct parallelism between the two curves, and West has on the average a heavier rainfall than East for every week of the year.

The totals for the quarters which are entered upon the diagrams show how the different elements compare for the four districts as regards the general result.

The sunshine results are very interesting: East and West go closely together, with a prominence at the beginning of April, until spring is ended; West gets a little more sun than East, fourteen hours in the quarter, and for about the month of June the advantage is maintained; then East takes the lead, and keeps it till the end of the summer, when the curves become practically coincident, and remain so throughout the autumn and winter.

Between the North and South, on the other hand, there is a very large difference throughout the year. The excess of sunshine in the South is most conspicuous in the summer. This is clearly due to meteorological causes, for astronomically there is much more sunshine "possible" in the summer months in the far North than in the south, yet the Channel Islands get 320 hours more sunshine in the summer than Scotland N.; it amounts indeed to nearly twice as much. It is not of course surprising that there is a great preponderance of sunshine in the South in winter, when the hours of daylight in the North are very much reduced.

There are conspicuous irregularities in all the curves from May to the end of July, and again a curious but marked dip in the last week of summer corresponding with the rainfall flush already noticed.

The temperature results follow those for sunshine very closely, but the period of greatest heat lags considerably behind the period

of greatest sunshine. The noticeable points are the predominance of the East over West as regards accumulated temperature above 42° during the greater part of the summer, and the reversal of that state of things in the early autumn. The latter feature is also particularly well illustrated by the excess of accumulated temperature below 42° in the East throughout the winter period. In this respect there is little to choose between East and North, the curves for the two are very similar.

The peculiar appositeness of the use of 42° as a base temperature in distinguishing the seasons is very well exhibited by the diagram. Summer as there shown is practically the period when there is no accumulation below 42° in any part of the British Isles. And, on the other hand, in the extreme South nothing is practically accumulated below 42° until winter commences; though when once that season has commenced, some temperature below 42° is shown lasting beyond the end of the winter of this paper, indeed, until the middle of spring. The whole annual amount for the South is 141 day degrees, which, contrasted with the larger totals of 783 for the North, or 751 for the East, is a very good index of the comparative mildness of the winter of the Channel Islands.

Tables IX and X must be allowed to speak for themselves. To give in words a general description of the course of events represented by the figures would be tedious and useless, and the latter must be used, like Table VII, as an index and outline of the information available in reply to any question that may arise for which such information is required. The relation between the autumn rainfall for the wheat-producing districts and the yield of wheat for England will be easily traced in the columns of the table.

Attention may be called in passing to the remarkable succession of dry weeks in the North for the whole of the period from 1878 to 1889, which must of necessity be balanced by a corresponding preponderance of wet weeks or of heavy rainfall in the remaining years. There are no fewer than 426 dry weeks in the 48 quarters, giving an average of nearly nine dry weeks per quarter for the whole period. No such preponderance is shown in the other districts. This is one of the many matters of significance for pure meteorology which suggest themselves upon an examination of the tables.

TABLE IX.—THE SUCCESSION OF SEASONS

Compiled from the Weekly Values for the **Principal Wheat-Producing Districts** and
Yield of Wheat for England, and Gales

Average.				Principal Wheat-producing Districts.	1884-5.				1885-6.			
W.	Sp.	Sum.	Au.		W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
6.18	5.24	7.04	7.80	Rainfall: Difference from average, in inches ...	+0.66	+0.57	-2.95	+2.36	-0.71	+1.73	-1.55	-0.05
—	—	—	—	Number of weeks below average ...	6	7	11	5	7	5	9	8
49	42	43	50	Rain-Days: Difference from average ...	+ 4	+ 3	- 12	+ 8	0	+ 10	- 6	0
—	—	—	—	Number of weeks below average ...	3	5	9	3	6	5	8	6
160	464	531	278	Sunshine: Difference from average, in hours ...	- 63	- 28	+ 12	- 13	- 12	- 81	+ 20	- 11
—	—	—	—	Number of weeks above average ...	1	7	6	5	6	4	7	6
—	—	—	—	Accumulated Temperature: Above 42° F. ...	—	—	—	—	—	—	—	—
132	559	1481	701	Difference from average, in day-degrees ...	+ 20	-101	- 66	-120	- 80	- 72	- 23	+172
—	—	—	—	Number of weeks above average ...	6	3	4	2	2	3	5	9
—	—	—	—	Accumulated Temperature: Below 42° F. ...	—	—	—	—	—	—	—	—
467	186	0	98	Difference from average, in day-degrees ...	- 78	+ 34	0	+ 9	+126	+ 45	0	- 53
—	—	—	—	Number of weeks above average ...	5	9	—	6	8	6	—	2
—	—	—	—	Phenological Data: First flowering of—	—	—	—	—	—	—	—	—
—	132	—	—	Forest Trees (Horse Chestnut)	—	—	—	—	—	—	—	—
45	139	163	273	Shrubs: (Hazel, Hawthorn, Dog-rose, Ivy) ...	—	—	—	—	—	—	—	—
68	151	194	—	Herbs: (Coltsfoot, White Ox Eye, Greater Bindweed)	—	—	—	—	—	—	—	—
—	—	224	—	Beginning of Corn Harvest ...	—	—	—	—	—	—	—	—
—	—	30.0	—	Yield of wheat (England) in bushels per acre ...	—	—	31.5	—	—	—	27	—
6.4	3.3	0.6	5.5	Gales: Number of gales (East Coast) ...	10	1	0	7	3	5	0	6
PRINCIPAL GRAZING DISTRICTS.												
11.04	7.43	9.68	11.70	Rainfall: Difference from average in inches ...	+1.57	0	-3.57	+1.25	-1.60	+2.22	-1.89	+2.4
—	—	—	—	Number of weeks below average ...	4	8	10	6	9	6	8	—
57	47	49	55	Rain-days: Difference from average ...	+ 4	+ 4	- 15	+ 9	- 3	+ 6	- 5	+ 6
—	—	—	—	Number of weeks below average ...	5	4	8	3	8	5	7	—
159	478	509	276	Sunshine: Difference from average in hours ...	- 39	- 37	+ 30	- 12	- 30	- 94	- 33	- 2
—	—	—	—	Number of weeks above average ...	3	6	7	4	4	5	3	—
—	—	—	—	Accumulated Temperature: Above 42° F. ...	—	—	—	—	—	—	—	—
192	560	1419	720	Difference from average in day-degrees ...	- 8	-141	-112	-141	- 97	-109	- 54	+10
—	—	—	—	Number of weeks above average ...	6	2	2	3	2	3	2	—
—	—	—	—	Accumulated Temperature: Below 42° F. ...	—	—	—	—	—	—	—	—
307	128	0	60	Difference from average in day-degrees ...	- 18	+ 55	0	- 4	+115	+ 52	0	- 4
—	—	—	—	Number of weeks above average ...	6	8	—	5	10	6	—	—
13.1	5.0	1.6	10.2	Gales: Number of gales (West Coast) ...	14	5	1	6	9	11	1	—

IN THE BRITISH ISLES.—EAST AND WEST.

the Principal Grazing Districts, with Phenological Data for the Wheat Districts.
for Eastern and Western Coasts.

1886-7.				1887-8.				1888-9.				1889-90.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
+0.27	-0.18	-2.61	-0.77	-1.73	+1.02	+2.73	-0.82	-1.77	+2.41	+0.20	-1.30	-0.61	-0.18	+1.61	-1.17
8	7	11	8	10	5	5	8	9	4	6	8	7	8	6	8
- 8	+ 2	- 13	- 1	- 3	+ 6	+ 11	- 4	- 3	+ 8	- 1	- 6	- 1	+ 2	+ 10	- 2
8	5	11	8	5	5	3	8	5	5	5	7	6	4	2	7
+ 53	- 36	+146	- 37	- 6	- 66	-139	- 20	- 10	-108	- 19	- 45	- 9	- 7	- 78	+ 58
10	7	11	5	7	2	1	5	6	4	6	5	5	4	3	8
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
- 16	- 95	+168	-226	- 79	-110	-247	- 40	- 34	+ 65	- 9	- 47	+ 5	+ 13	-125	+147
4	4	11	0	1	3	2	4	4	9	6	6	5	7	3	9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
+ 74	+ 59	0	+ 84	+123	+ 50	0	- 16	+ 30	- 41	0	- 7	- 59	- 30	0	+ 18
7	6	—	7	10	8	—	5	6	4	—	4	6	6	—	4
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	32.3	—	—	—	28.2	—	—	—	29.9	—	—	—	30.8	—
4	4	0	2	4	5	0	9	2	1	0	4	5	2	2	6
-0.33	-1.67	-2.56	-2.84	-3.82	+0.91	+2.84	-1.33	-1.10	+1.55	-1.22	-2.05	+0.35	+0.22	+1.02	+1.08
8	10	9	10	10	5	5	8	7	5	8	8	6	8	4	6
- 7	- 8	- 12	- 8	- 10	+ 3	+ 8	- 3	- 2	+ 8	- 5	- 2	0	+ 6	+ 11	+ 3
8	9	9	8	9	5	2	6	6	4	6	8	6	5	2	4
+ 43	+ 30	+145	- 17	+ 17	- 48	- 63	- 30	+ 2	- 95	+ 25	- 47	- 2	- 1	- 65	+ 2
8	7	11	5	6	4	4	5	7	3	5	4	5	8	4	7
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
- 22	- 54	+179	-210	-102	-110	-160	- 23	- 9	+ 36	- 24	- 19	+ 14	+ 25	-135	+159
5	7	11	1	2	4	4	5	6	8	6	5	4	6	2	10
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
+ 60	+ 69	0	+ 56	+107	+ 48	0	- 28	- 11	- 38	0	- 16	- 43	- 31	0	- 5
7	6	—	7	8	6	—	1	5	3	—	2	6	5	—	2
11	1	0	6	9	7	3	13	9	1	0	5	16	3	6	13

TABLE IX.—THE SUCCESSION OF SEASONS IN THE

*Compiled from the Weekly Values for the Principal Wheat-Producing Districts and
Yield of Wheat for England, and Gale*

	1890-1.				1891-2.				1892-3.			
	W.	Sp.	Sum.	Aut.	W.	Sp.	Sum.	Aut.	W.	Sp.	Sum.	Aut.
PRINCIPAL WHEAT-PRODUCING DISTRICTS.												
Rainfall	-2.93	+0.86	+1.31	+1.91	-0.22	-0.70	+0.94	+1.20	-0.23	-3.34	-0.53	-0.9
Dry weeks	11	6	6	6	7	8	4	6	8	12	8	7
Rain-days	-16	+4	+6	+6	0	-2	+2	+5	+3	-22	+1	-1
Fair weeks	11	4	5	5	7	6	6	5	3	11	5	7
Sunshine	+37	-61	-64	-2	+4	+88	-26	-32	-4	+155	+49	+48
Sunny weeks	9	4	4	6	8	10	5	4	5	11	7	8
Temp. above 42° F.	-7	-142	-73	+22	-30	+29	-156	-151	-37	+269	+182	-46
Warm weeks... ..	5	4	6	8	4	6	3	1	6	12	10	4
Temp. below 42° F.	+188	+70	+1	+8	+118	+111	+3	+27	+93	-63	0	+4
Chilly weeks... ..	9	8	1	3	7	8	1	6	5	2	—	—
Trees	—	(+16)	—	—	—	+11	—	—	—	-13	—	—
Shrubs	(-1)	(+13)	(+12)	(+12)	(0)	+5	(+4)	(+6)	(0)	-20	-19	(-15)
Herbs	(+1)	(+12)	(+12)	—	+2	+1	(+2)	—	-6	-12	(-18)	—
Date of Harvest	—	—	+12	—	—	—	+12	—	—	—	-12	—
Yield of Wheat	—	—	31.3	—	—	—	26.2	—	—	—	25.8	—
Gales	3	7	1	7	8	2	2	4	4	0	0	—
PRINCIPAL GRAZING DISTRICTS.												
Rainfall	-4.80	-0.45	+1.64	+2.87	+0.05	-0.40	+1.17	+1.17	-1.22	-3.99	-0.81	-1.1
Dry weeks	10	5	6	4	8	8	6	6	8	11	6	—
Rain-days	-16	-4	+4	+5	-1	-3	-3	+9	+3	-21	-4	+
Fair weeks	10	8	4	3	5	8	6	3	5	11	6	—
Sunshine	+33	-37	-30	+11	+7	+55	-12	-7	-6	+70	+72	+2
Sunny weeks... ..	8	4	4	6	7	8	4	4	8	7	10	—
Temp. above 42° F.	-7	-108	-34	-16	-43	+18	-110	-150	-21	+293	+229	-4
Warm weeks... ..	6	3	5	5	5	6	2	2	7	12	12	—
Temp. below 42° F.	+66	+67	0	+19	+68	+82	0	+16	+28	-72	0	+6
Chilly weeks... ..	6	9	—	4	6	7	—	5	6	1	—	—
Gales	7	5	2	14	17	2	4	10	14	1	1	—

BRITISH ISLES.—EAST AND WEST—Contd.

the Principal Grazing Districts, with Phenological Data for the Wheat Districts.
for Eastern and Western Coasts.

1893-4.				1894-5.				1895-6.				1896-7.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
+1.47	+0.18	+1.31	+0.14	-0.18	-0.83	+1.27	+0.09	-2.16	-1.23	-0.99	+2.20	+2.22	+0.82	+0.72	-2.79
4	7	4	8	8	10	6	7	12	7	10	6	6	6	6	10
+ 8	+ 4	+ 7	- 2	0	- 5	- 1	- 7	- 9	- 1	- 1	+ 8	+ 10	+ 3	- 2	- 11
2	6	3	6	4	9	6	9	8	6	6	4	2	4	7	8
+ 29	+ 35	- 69	- 33	+ 22	+ 11	+ 33	+ 80	- 25	+ 3	+ 7	- 38	- 27	+ 27	+ 77	+ 5
9	8	3	5	8	5	7	10	5	7	6	6	6	5	10	6
+ 31	+ 32	+ 55	- 23	- 68	+ 54	+ 15	+105	+ 3	+ 82	+ 46	- 74	- 29	- 8	+ 96	- 15
8	7	5	5	3	9	6	9	5	8	6	5	2	6	9	6
- 32	- 52	0	- 31	+323	- 25	0	+ 6	- 86	- 81	0	+ 61	+ 10	- 36	0	- 21
5	2	—	3	10	4	—	2	4	3	—	6	6	3	—	3
—	- 18	—	—	—	- 3	—	—	—	- 7	—	—	—	+ 2	—	—
(-10)	(-16)	0	(+10)	(+30)	0	- 4	- 7	- 11	- 13	- 11	- 3	- 3	0	- 1	- 1
- 7	- 1	(+ 5)	—	+ 13	- 3	- 8	—	- 7	- 7	- 10	—	- 11	- 4	- 3	—
—	—	+ 3	—	—	—	- 3	—	—	—	- 12	—	—	—	+ 1	—
—	—	30.7	—	—	—	26.2	—	—	—	33.9	—	—	—	29.0	—
12	1	0	4	9	3	0	7	6	5	0	6	6	5	2	2
+3.73	+0.62	+0.18	-1.14	-2.79	-0.90	+0.73	-1.05	-2.30	-0.70	-0.15	-0.09	-0.11	+2.07	+2.67	-2.17
3	5	4	9	9	9	7	9	10	8	8	8	7	4	5	9
+ 13	+ 2	+ 7	- 12	- 6	- 3	+ 1	- 7	- 6	- 3	0	+ 2	+ 2	+ 8	+ 7	- 10
4	5	2	8	6	8	7	8	8	7	7	5	5	5	5	9
+ 5	+ 22	- 86	+ 7	+ 23	- 17	- 3	+ 63	- 45	+ 22	+ 9	- 22	- 3	+ 17	+ 7	+ 15
8	7	3	8	9	6	5	12	1	5	7	6	7	5	6	8
+ 52	+ 32	- 50	- 3	- 83	+ 54	- 6	+ 80	+ 45	+125	+ 47	- 79	- 48	- 8	+ 93	+ 39
10	7	5	6	3	8	5	8	9	10	8	5	3	6	8	7
- 44	- 57	0	- 17	+278	- 23	0	+ 18	- 94	- 76	0	+ 69	+ 41	- 23	0	- 28
5	3	—	2	10	4	—	2	4	0	—	6	8	5	—	2
27	6	1	8	13	3	0	11	6	11	1	9	14	10	3	6

TABLE IX.—THE SUCCESSION OF SEASONS IN

Compiled from the Weekly Values for the Principal Wheat-Producing Districts and Yield of Wheat for England, and Gales

	1897-8.				1898-9.				1899-1900.			
	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
PRINCIPAL WHEAT-PRODUCING DISTRICTS.												
Rainfall	-1·08	+0·91	-2·35	-0·33	+0·98	+1·00	-2·51	+0·21	+3·47	-1·35	+1·08	-0·57
Dry weeks	8	6	10	10	7	5	10	6	5	10	7	6
Rain-days	- 2	+ 7	- 9	- 7	- 1	+ 3	- 13	- 10	+ 10	- 6	+ 1	+ 2
Fair weeks	4	4	10	7	6	5	10	7	3	8	5	5
Sunshine	+ 14	- 66	+ 12	+ 7	+ 47	+ 8	+113	+ 46	- 17	- 50	+ 33	+ 31
Sunny weeks...	7	4	7	6	9	6	9	7	5	5	7	8
Temp. above 42° F. ...	+ 87	- 59	+ 19	+214	+120	- 26	+230	+ 94	- 46	- 85	+ 96	+ 56
Warm weeks	10	5	8	10	11	7	12	8	3	3	8	8
Temp. below 42° F. ...	-176	- 15	0	- 43	-155	+ 24	0	- 53	+ 79	+ 16	0	- 40
Chilly weeks	2	6	—	2	3	7	—	3	7	5	—	2
Trees	—	+ 6	—	—	—	+ 9	—	—	—	+ 6	—	—
Shrubs	- 20	- 1	+ 4	+ 2	- 5	+ 4	+ 2	+ 2	+ 8	+ 4	+ 4	+ 9
Herbs	- 16	+ 3	+ 4	—	- 4	+ 6	- 1	—	+ 8	+ 7	+ 3	—
Date of Harvest	—	—	+ 4	—	—	—	- 3	—	—	—	0	—
Yield of Wheat	—	—	34·8	—	—	—	32·8	—	—	—	28·4	—
Gales	5	5	1	5	8	2	0	7	8	5	2	2
PRINCIPAL GRAZING DISTRICTS.												
Rainfall	+0·70	+0·69	-1·73	+0·25	+1·97	+1·87	-2·49	-0·51	+3·42	-1·03	+1·78	+1·81
Dry weeks	6	5	9	6	6	5	9	9	4	8	6	6
Rain-days	+ 2	+ 2	- 6	+ 1	+ 4	+ 5	- 13	- 2	+ 7	- 6	+ 5	+ 3
Fair weeks	4	6	8	6	5	3	9	7	5	7	4	4
Sunshine	+ 19	- 18	+ 29	+ 2	+ 25	+ 8	+111	+ 20	+ 11	- 18	+ 8	+ 39
Sunny weeks	7	6	7	6	8	6	8	6	8	5	6	7
Temp. above 42° F. ...	+106	- 41	+ 60	+198	+113	- 15	+262	+ 91	- 58	- 65	+ 79	+ 25
Warm weeks...	10	6	9	11	11	6	12	9	4	4	7	7
Temp. below 42° F. ...	-154	- 22	0	- 26	-107	- 6	0	- 53	+ 80	+ 20	0	- 12
Chilly weeks	2	4	—	1	4	5	—	2	6	5	—	2
Gales	13	5	1	11	15	3	0	13	17	5	3	11

THE BRITISH ISLES.—EAST AND WEST—*Contd.*

*the Principal Grazing Districts, with Phenological Data for the Wheat Districts.
for Eastern and Western Coasts.*

[illegible]

TABLE X.—THE SUCCESSION OF SEASONS

Compiled from the Weekly Values for Scotland North, and the Channel

Average.				1884-5.				1885-6.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
SCOTLAND, N.											
14.42	8.66	9.75	14.55	Rainfall: Diff. from average in inches				-3.56	-1.73	-3.50	-3.14
—	—	—	—	No. of weeks below average...				8	7	10	9
68	57	56	65	Rain-days: Diff. from average...				-4	+4	0	-1
—	—	—	—	No. of weeks below average...				6	7	4	6
109	419	397	211	Sunshine: Diff. from average in hours				-28	+7	+67	+27
—	—	—	—	No. of weeks above average...				3	7	8	7
Accumulated temp. above 42° F.											
91	366	1067	505	Diff. from average in day-degrees				-46	-98	-220	-127
—	—	—	—	No. of weeks above average...				4	3	1	3
Accumulated temp. below 42° F.:—											
439	230	1	113	Diff. from average in day-degrees				-34	+8	+3	+28
—	—	—	—	No. of weeks above average...				4	5	1	6
11.5	5.1	1.0	8.7	Gales: No. of gales (N. Coast) ...				7	3	1	8
CHANNEL ISLANDS.											
9.34	5.81	6.66	10.56	Rainfall: Diff. from average in inches				+1.55	+0.20	-3.46	+3.03
—	—	—	—	No. of weeks below average...				5	8	9	5
61	46	45	59	Rain-days: Diff. from average				+10	+5	-10	+12
—	—	—	—	No. of weeks below average...				4	5	8	3
224	606	717	373	Sunshine: Diff. from average in hours				-82	+25	+42	-55
—	—	—	—	No. of weeks above average...				2	8	7	5
Accumulated temp. above 42°F.:—											
341	694	1669	1080	Diff. from average in day-degrees)				-11	-204	-120	-155
—	—	—	—	No. of weeks above average...				7	3	3	1
Accumulated temp. below 42°F.:—											
105	33	0	3	Diff. from average in day-degrees				-6	-7	0	-3
—	—	—	—	No. of weeks above average...				4	3	—	0
8.1	3.2	1.6	7.3	Gales: No. of gales (S. Coast) ...				12	3	3	14

IN THE BRITISH ISLES.—NORTH AND SOUTH.

Islands, with the Numbers of Gales for the North and South Coasts.

1886-7.				1887-8.				1888-9.				1889-90.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
+1.12	-2.21	+0.28	-3.14	-3.74	+1.87	-1.12	+0.72	-1.73	-0.58	-1.30	-3.69	-0.49	+1.72	+3.33	+6.03
4	9	6	8	9	5	9	10	9	9	11	9	8	5	3	6
- 2	- 7	+ 3	+ 2	- 2	+ 10	- 5	- 4	+ 1	+ 7	- 4	- 6	- 2	+ 1	+ 14	+ 10
4	7	5	5	4	3	7	8	6	5	6	8	5	5	2	4
+ 9	-107	+ 24	- 68	+ 17	- 20	+ 80	- 42	- 6	-106	- 30	- 38	- 12	- 14	- 77	- 8
8	4	9	3	9	4	8	4	6	3	3	3	4	5	1	6
+ 15	- 36	+ 79	-177	- 52	-111	-193	- 36	+ 22	+ 79	+ 22	- 5	+ 29	+ 53	-140	+144
5	4	10	0	2	2	2	4	7	7	7	6	7	9	3	9
- 5	+ 82	- 1	+ 62	+168	+ 89	0	+ 9	- 27	- 58	- 1	- 18	- 92	- 21	- 1	- 9
6	6	0	7	10	9	1	4	3	2	0	4	2	4	0	3
9	2	0	4	7	7	0	12	7	3	0	4	11	7	0	15
-0.32	-0.99	-1.91	-0.78	-2.29	+1.73	+2.67	-1.98	-1.69	-0.37	+0.41	-0.32	+0.17	+1.03	+2.72	-3.19
9	7	9	10	10	5	5	8	7	7	6	7	7	6	4	8
- 7	+ 2	- 18	+ 2	- 1	+ 10	+ 12	- 1	- 1	+ 3	- 2	- 2	- 1	+ 7	+ 7	- 7
7	5	10	5	6	3	4	6	5	5	6	7	7	5	3	7
+ 85	- 12	+153	- 22	- 22	- 45	-175	+ 30	+ 7	-102	- 69	- 15	+ 6	- 38	-111	+ 22
11	6	9	7	4	5	0	7	5	3	6	4	7	6	3	7
- 93	-161	+166	-284	-161	-143	-198	- 10	- 13	0	- 18	- 45	+ 53	- 4	-203	+ 35
4	0	10	0	1	3	1	7	6	7	8	6	6	8	0	10
+ 21	+ 28	0	+ 6	+117	+ 37	0	- 3	- 42	- 18	0	+ 5	- 40	- 10	0	+ 20
7	4	—	1	8	4	—	0	1	0	—	1	2	1	—	1
7	4	0	5	6	4	3	8	6	2	3	6	7	0	4	7

TABLE X.—THE SUCCESSION OF SEASONS IN

Compiled from the Weekly Values for Scotland North and the Channel

	1890-1.				1891-2.				1892-3.			
	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
SCOTLAND N.												
Rainfall	-0·67	-2·55	+3·82	+1·14	+0·07	+0·01	+1·22	+3·05	-1·53	-1·67	-0·22	+9·28
Dry weeks	7	9	4	5	8	7	6	7	8	9	9	3
Rain-days	- 7	- 7	+ 5	- 2	- 1	+ 4	+ 3	+ 5	- 2	- 11	+ 2	+ 9
Fair weeks	7	7	4	5	6	8	5	5	5	9	7	3
Sunshine	+ 9	+ 67	- 42	- 16	+ 9	+ 31	- 9	- 50	- 15	- 51	- 29	- 42
Sunny weeks... ..	8	8	3	4	8	10	5	2	3	6	5	4
Temperature above 42° F.	+ 45	- 76	+ 43	+ 33	- 32	- 11	-112	-148	- 41	+219	+238	-103
Warm weeks... ..	8	3	6	7	3	5	3	3	3	12	12	3
Temperature below 42° F.	- 44	+124	+ 3	+ 25	+110	+ 96	+ 5	+ 37	+106	-103	- 1	+ 63
Chilly weeks... ..	5	12	1	4	8	8	1	6	7	2	0	6
Gales	9	8	1	12	14	1	2	12	8	2	1	11
CHANNEL ISLANDS.												
Rainfall	-4·39	+2·71	+1·61	+3·36	-0·18	-0·67	-0·64	+0·38	-0·89	-4·07	-1·39	+0·17
Dry weeks	11	6	8	5	9	8	8	6	7	12	8	6
Rain-days	- 24	+ 5	+ 3	+ 2	0	- 8	- 8	+ 5	+ 3	- 28	- 9	+ 3
Fair weeks	10	6	6	4	7	7	7	4	5	11	8	6
Sunshine	+126	- 21	- 65	+ 51	+ 1	+106	+ 45	- 55	- 15	+241	+146	+ 3
Sunny weeks... ..	10	3	5	7	7	12	8	3	3	11	10	5
Temperature above 42° F.	-124	-120	- 83	- 46	- 30	- 20	- 17	-116	- 22	+341	+257	- 36
Warm weeks... ..	4	4	4	8	7	6	7	4	7	13	13	7
Temperature below 42° F.	+103	+ 13	0	+ 2	+ 33	+ 20	0	- 3	+ 4	- 33	0	+ 6
Chilly weeks	8	4	—	1	5	4	—	0	5	0	—	1
Gales	3	3	3	8	8	2	3	3	5	1	0	8

THE BRITISH ISLES.—NORTH AND SOUTH—Contd.

Islands, with the Numbers of Gales for the North and South Coasts.

1893-4.				1894-5.				1895-6.				1896-7.			
W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
+10·39	-0·58	+2·53	-5·38	-1·68	+0·93	+3·64	+0·65	+2·06	+3·57	+2·12	+1·00	-4·13	+1·83	+0·09	-0·92
2	8	5	11	8	5	4	6	7	5	8	6	10	8	6	8
+ 11	- 10	- 1	- 11	- 6	- 2	+ 4	- 1	- 5	+ 5	+ 2	- 2	- 5	- 1	- 3	- 6
2	7	7	7	6	6	4	7	6	4	5	5	6	7	6	9
- 51	+ 60	- 24	- 7	+ 42	- 57	- 48	+ 14	- 44	- 16	- 67	- 30	- 4	+ 46	+ 36	+ 31
1	8	6	6	8	3	3	8	1	5	3	5	8	6	5	6
+ 6	+ 94	+103	+ 21	- 35	+ 78	+ 47	+72	+ 31	+ 94	+ 1	- 30	- 22	- 10	+135	+ 33
5	6	8	7	3	7	7	8	5	8	5	6	3	7	10	8
- 42	- 59	- 1	- 30	+237	- 53	0	+ 35	-147	- 92	- 1	+ 28	+ 99	- 3	- 1	- 23
5	4	0	2	9	4	1	5	3	2	0	5	7	5	0	4
21	6	1	4	10	4	1	8	8	5	2	8	12	12	2	7
+0·67	+0·77	+4·31	+1·27	-1·53	-0·70	-0·56	+0·53	-2·56	-2·31	-0·99	+3·03	+3·37	+1·98	+1·13	-3·02
6	6	5	8	8	7	9	7	11	10	7	5	5	7	7	8
+ 4	+ 3	+ 11	- 9	- 5	- 4	- 2	- 5	- 9	- 4	- 5	+ 9	+ 12	+ 11	+ 4	- 15
4	3	3	8	4	9	8	6	7	8	7	3	3	3	6	9
+ 45	+ 12	-171	- 21	+ 33	+ 11	+ 13	+ 81	- 42	+ 3	+ 66	- 55	- 55	- 81	- 11	- 47
11	7	3	5	7	7	9	10	4	7	8	5	4	2	4	4
+ 38	+ 83	- 64	+ 50	-116	+ 4	+ 23	+202	+ 79	+179	+116	-141	- 5	+ 55	+126	+ 60
9	9	4	9	3	6	9	11	10	12	9	4	7	9	9	7
- 10	- 32	0	- 3	+222	+ 3	0	+ 1	- 64	- 33	0	+ 4	- 17	- 32	0	- 3
2	0	—	0	8	3	—	1	2	0	—	1	4	0	—	0
15	1	0	5	9	0	2	8	4	7	0	8	5	3	1	4

TABLE X.—THE SUCCESSION OF SEASON

Compiled from the Weekly Values for Scotland North, and the Channel

	1897-8.				1898-9.				1899-1900.			
	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.	W.	Sp.	Sum.	Au.
SCOTLAND, N.												
Rainfall	+6.10	+3.10	+0.99	+3.96	+5.21	+3.30	-3.46	+7.19	0	+0.23	+0.81	+1.90
Dry weeks	3	6	8	5	4	6	10	3	6	8	4	7
Rain-days	+ 9	+ 7	- 3	- 3	- 1	+ 1	- 15	+ 10	0	0	+ 3	+ 3
Fair weeks	1	5	8	7	3	6	8	2	6	5	5	3
Sunshine	- 7	- 1	+ 40	+ 62	+ 25	0	+ 73	- 23	+ 9	- 35	- 15	- 3
Sunny weeks	5	6	9	8	7	8	7	3	7	4	7	5
Temperature above 42° F.	+ 42	+ 1	+ 52	+158	+ 53	- 30	+292	+ 96	- 49	- 24	+123	+ 16
Warm weeks... ..	8	8	8	9	7	7	13	9	3	4	7	5
Temperature below 42° F.	- 90	- 58	- 1	- 12	- 58	+ 63	- 1	- 80	+128	+ 1	- 1	+ 5
Chilly weeks... ..	3	4	0	2	4	5	0	2	7	5	0	4
Gales	14	2	0	6	13	2	1	12	14	6	0	6
CHANNEL ISLANDS.												
Rainfall	-1.18	+0.83	-1.99	-0.73	+1.92	-0.21	-3.05	-2.79	+5.76	-0.77	-1.34	-1.90
Dry weeks	8	6	9	8	7	7	9	9	4	7	8	8
Rain-days	0	+ 4	- 7	- 1	- 5	- 1	- 19	- 18	+ 11	- 6	+ 3	- 3
Fair weeks	5	6	7	7	7	5	9	9	4	8	6	6
Sunshine	+ 24	- 62	+ 59	+ 54	+ 10	+ 5	+152	+ 37	- 44	- 20	+ 26	+ 52
Sunny weeks	9	5	8	9	7	6	10	6	2	5	6	8
Temperature above 42° F.	+146	+ 11	+ 81	+250	+239	+ 78	+311	+207	+ 29	- 12	+115	+144
Warm weeks... ..	11	7	8	12	11	9	12	11	9	6	9	12
Temperature below 42° F.	- 79	0	0	- 3	- 63	+ 6	0	- 3	- 20	+ 11	0	- 3
Chilly weeks... ..	1	3	—	0	2	2	—	0	5	2	—	0
Gales	6	5	0	3	10	3	0	6	8	1	3	5

IN THE BRITISH ISLES.—NORTH AND SOUTH—*Contd.*

Islands, with the Numbers of Gales for the North and South Coasts.

[illegible]

Meteorological Data for the Reports of the Registrars-General.

I ought not to close the consideration of the problem of presenting in a concise form the representation of the seasons in the British Isles, without some further reference to the application of the information to the purposes of the Registrars-General in their weekly, quarterly, and annual reports. For reasons which have already been detailed, it is at least possible that the system of procedure by values for districts would be as suitable in these cases as in others, and I have added the vital statistics for the eastern counties to Table VII in order to illustrate this suggestion. But the practice is otherwise. The meteorological data given in the periodical returns of the Registrars-General are for individual stations, though district values are also compiled for the quarterly returns of the Registrars for England and Ireland. The preparation of the information for England was for upwards of sixty years in the hands of the late Mr. J. Glaisher, and has only recently been transferred to the Meteorological Office, which has, however, prepared the information for Ireland for many years past. That for Scotland is prepared by the Scottish Meteorological Society. When Mr. Glaisher gave up the work, a common form was agreed upon by those interested in such matters, and the system is now practically uniform for the three Kingdoms.

So far as England is concerned, for which a large number of stations are available, an endeavour is made in selecting the stations for which the data are given to have representative stations in each of the meteorological districts. The conditions to be represented are high and low; urban, suburban, and rural; coast and inland; and from this point of view a fairly satisfactory selection of stations has been made.

But I am not aware that the data of individual stations for successive quarters or years are used to any large extent for examining the relations between statistics of mortality and disease and those of the weather. The compilation of summary tables for successive seasons is confined to those for Greenwich, and when it is necessary to trace a connection extending over a series of years, the tendency is to use the Greenwich values and make them apply to London, or, if necessary, to England. Dr. Longstaff, for example, has published most interesting comparisons of statistics of disease with the seasonal changes, using Greenwich values for the meteorological information.

The restriction of such inquiries to what can properly be referred to Greenwich is a serious limitation, but the preparation of similar tables for all the individual stations which contribute

returns for the Registrars-General would be extravagant and unnecessary, and we are brought back again to the problem from which we set out, viz., the proper scientific method of combining meteorological information so that it may be immediately applicable, in the first instance at least, to any problem concerning the influence of weather on disease that may suggest itself to those interested in the weather in any part of the country. Such combination may not be sufficient for dealing with all details, but it ought to be sufficient for indicating the main outlines of any relationship that has a real existence.

Conclusion.

I am therefore brought back, in conclusion, to one purpose I have had in view in putting together the information that is set out in this paper. An obvious consideration is that the meteorological statistics such as those upon which the paper is based are not put together merely for their own sake. They may contribute to the identification of meteorological laws, but they are intended to be utilised especially in what may be called the practical applications of meteorology, the study of the relations of various phenomena to the weather. The establishment of such relations must proceed by statistical methods, and for such methods to be applied effectively the facts must be grouped so as to give comparable data. I have collected together the statistics of a number of different phenomena related to the weather in the form in which they exist at present, so that anyone who is so disposed may express an opinion upon their suitability for the purpose of comparison.

In such inquiries an investigator is nearly always brought up on account of the lack of a homogeneous body of statistics for a sufficiently long period. One can often find material enough to suggest a relation, but not enough to prove one effectually. While therefore continuity of statistical method is of very high importance, it is only available if the method is one that can be employed when the statistics have been compiled, and it is upon that aspect of the question that I think a free expression of opinion is desirable.

I have, for example, given the statistics of sea casualties with those of gales and storm warnings. I have done so because the question has been put to me from time to time whether the service of storm warnings, which has been in operation for nearly fifty years, can be shown to have had any appreciable effect in preventing casualties at sea. The statistics are most inadequate for answering such a question. The exhibition by statistics of what has been prevented would always present some difficulty, but the available statistics for the answer to this question are so confused as to time

periods and the causes of the casualties that one cannot even make a beginning. The only conclusion one can draw is that in any year there are still a large number of sea casualties to be prevented if possible. On the other hand, the relation between the yield of wheat and the rainfall of the previous autumn for England which arises from Table IX is so close that the statistical representation must be regarded as effective in that instance.

Between these extremes lie many cases of intermediate character. Perhaps some modification in particulars which would not prevent essential continuity may be desirable, and on such points a free expression of opinion would be welcomed. In all statistical inquiries it is a manifest advantage to find information in a form ready for direct application. To compile a body of statistics extending over a long series of years is a very laborious and costly undertaking, even when the materials for the compilation exist. Meteorological information is of common interest to many subjects, and it is therefore a matter of practical importance for the future, as well as for the present, to take into account all circumstances that may increase their utility. From this point of view the differences in the groupings of the counties for various purposes are the most conspicuous features of divergence; and these are more apparent with regard to the Registrar-General's districts than the Agricultural divisions.

A practice which is very noticeable among statistical tables is to group a number of districts together when giving details for months, and to group the twelve months together when dealing with smaller units of area. It is difficult to see the scientific ground for this practice; it would certainly present some difficulties as a method of dealing with meteorological results. We should require to assume that seasonal variations may be disregarded if we deal with a small district, and geographical variations may be disregarded in considering seasonal variations. Neither of the assumptions would appear to be well grounded. As applied to the subject of this paper the process may be illustrated by supposing that one mean curve is used instead of the four separate ones in fig. 3, and *per contra* one column for the year instead of four in Tables VII, IX, and X. Either would diminish the value in a greater ratio than that in which it would economise space. It is, I think, not merely the sentiment of loyalty to distinguished predecessors on the Meteorological Council that inclines me to the opinion that Henry Smith, Galton, and Stokes were right in their method of dealing with the question, and that the better plan would be to choose units of area sufficiently homogeneous, to deal with these consistently throughout, and to use them for geographical and chronological comparisons.

The question of the use of district values is therefore especially worth consideration on this occasion. The selection of the districts by the Committee of the Council on Land Meteorology in 1878 was based upon the information then available, and was made with a view to service in the future. I have given full particulars from information accumulated since that time for the formation of a judgment upon the appropriateness of the selection.

But there are other questions that arise. The number and the nature of the elements included in the statistical presentation of the phenomena are obvious subjects of discussion in a Society which devotes itself to the increase of knowledge by statistical methods, and I have sought to put together the available information with regard to the seasons in such a way as to give opportunity for the discussion of the various points that arise.

I cannot fail to add a word of acknowledgment to the observers, many of them volunteers, who have furnished the material which forms the subject of this paper, and to the members of the Staff of the Meteorological Office, past as well as present, whose labours during twenty-seven years are represented in the information I have put before you.

DISCUSSION *on* DR. W. N. SHAW'S PAPER.

THE PRESIDENT said he had to announce the death of one of the Members, Mr. Alfred Harvey, well known to all in the commercial world as connected with banking. For many years Mr. Harvey took a prominent part in the affairs of the great banking concern of Messrs. Glyn, Mills, and Co., and he had left a name which would not be readily forgotten in circles where knowledge, skill, and diligence were valued.

As regarded the paper, he was sure that, without any formal vote, it would be the wish of the meeting to thank Dr. Shaw for a most instructive compilation, supplemented by many suggestions of importance. Dr. Shaw had necessarily confined his attention chiefly to the effect of weather upon agriculture; but as connected with the manufacturing districts he could not help thinking, as Dr. Shaw proceeded with his story, of the great importance of these figures to industrial and commercial interests. Dr. Shaw had called attention to the fact that in the north of England from 1878 to 1889 there was a remarkable drought. As Chairman at that time of the Canal Association, it was his duty to carefully consider this subject, and it was certainly interesting to notice how the scientific data set out by the reader of the paper accorded with the painful experience of the Directors of the Leeds and Liverpool Canal. That canal left the Irish Sea at Liverpool, and descended into the German Ocean at Goole, climbing in its passage over the

great central ridge of the island, and was perhaps the most interesting illustration we had of climatic influences. At one time they experienced a season of drought, at another abundance of water, which, while not a source of danger, certainly required skill and management to prevent mischievous floods. In this connection there was one thought to which he wished to give expression, that in the years to come our greatest national danger would prove to be the comparative scarcity of water to meet the wants of the growing population. It was therefore of the greatest importance to collect patiently, carefully, and accurately the fullest record of meteorological facts, so that the conditions to be dealt with, and the difficulties to be surmounted might be known to future generations.

Dr. H. R. MILL observed that there were difficulties in discussing such a paper in a useful manner owing to the mass of condensed material it contained. With regard to the suggestion made by Dr. Shaw as to the method of dealing with averages, it was, of course, necessary to use averages as a sort of standard with which to compare actual conditions. Averages, as Dr. Shaw had pointed out, had to be of two kinds—averages according to time, *i.e.*, of values at different dates in the same place, and averages according to space, *i.e.*, of values in different places at the same time. The former might be called historical, and the latter geographical averages.

In working at one small part of the subject, that dealing with rainfall, he had felt more and more the immense importance of dealing with areas rather than with stations, and of making the basis of calculation the map rather than the table of figures. The way in which the map could be utilised for the comparison of different distributions was seriously hampered by the different areas used as units by different statisticians. Almost every public department had a unit of its own, and when some time ago he put forward an ambitious scheme for a geographical description of the British Isles (which was faintly praised, and proved a failure, being drowned in warm water by its friends), he had occasion to go into the statistics of a great number of departments. The county was the only unit common to all, and it could not be avoided, but it was necessary almost always to go inside the county and to deal with parishes in order to group these smaller units in such a manner as to separate totally different natural regions over which a county spreads itself. For all scientific purposes the natural regions, determined by physical features, were alone important, and of the political or parochial units eight only were adopted, under protest as it were, because they were necessarily used in the collection of most statistics.

In the case of Perthshire, and still more in the case of Yorkshire, there, totally different characteristics were grouped together within a narrow small space, and in order to get regional averages possessed of scientific meaning these had to be separated. To take one example, the difference in average rainfall between Leeds and Bradford was more than 10 inches per annum. He would suggest that in comparing statistics of this sort an effort should be made to

get a general average map by combining in some way a series of maps, each referring to one period, instead of trying to compile a map from the necessarily small number of points for each of which the numerical average for a long period was available. With the observation of the Chairman as to the importance of keeping an exact account of the water supply of this country he was entirely in accordance, and he thought they ought to record their gratitude to the Liverpool and Leeds Canal Company for the considerable share they had taken in establishing records of rainfall along their route, crossing an exceedingly interesting portion of the country. It was very largely owing to the work done by engineers and by farmers and gardeners, as well as those interested in the subject from a purely scientific point of view, that they were able to give such a good account of the climatic condition of the country.

Professor EDGEWORTH said that of all the accredited physical sciences Meteorology seemed most to resemble the studies of the statist. Mathematical statistics especially might find here a model. The averages about which rainfalls or temperatures fluctuate are stable, or very slowly changing—unlike economic phenomena, which will not stand still to be measured. Here might be tested the two claims made on behalf of the theory of “errors:” that it served to effect precise measurements as in astronomy, and to exhibit the grouping of a set of quantities like wage-rates. If the methods which Mr. Bowley had employed for the latter purpose were to be applied to the statistics of weather, his asymmetrical curves would probably be required, for it was noticeable that the excess above the average was much greater than the defect in the case of rainfall and temperatures.

Mr. D. A. THOMAS, M.P., said he would like to direct a little criticism, or at any rate strike a note of hesitation in accepting the relation which Dr. Shaw said was clearly shown between the rainfall in the autumn and the subsequent wheat crop. He thought the basis on which he had formed that opinion was altogether too narrow to sustain the conclusions at which he had arrived, and the table given did not fully bear out the contention. Taking the year 1903, which Dr. Shaw said was an exceptional year, the rainfall in the autumn was the very lowest in the twenty years, being 50 per cent. below the average; whereas the subsequent wheat crop, so far from being the highest on record for the twenty years, was absolutely below the average. Then again, comparing the year 1886, in which the highest rainfall of the autumn occurred, with the year 1893, when the rainfall was just half what it was in 1886, the wheat crop was the lowest on record, and he could not help thinking that must have been due to the very low rainfall of the subsequent spring. What he wished to say was, that whereas he thought the table showed a relation between the autumnal rainfall and the subsequent crop, that relation was not so close as Dr. Shaw seemed to think; and although the rainfall in the autumn was a factor, it was by no means the only factor, and he very much questioned if it were the dominant factor.

Mr. R. H. HOOKER dissented from what Mr. Thomas had said, and thought that one of the most important points brought out was that the influence of the autumn rainfall was so much greater than had hitherto been suspected. The author had not maintained that it was the only factor; he had, in fact, been careful to point out that other factors had been predominant in just those years which Mr. Thomas appeared to consider disproved Dr. Shaw's contention. Of course, the fact that the autumn rainfall had an influence on the crop of the following year was practically, or perhaps he ought to say empirically, well known. For instance, nearly all the officers charged with the collection of harvest returns had attributed the low yield of corn crops in 1904 primarily to the exceedingly unfavourable autumn of 1903; secondly, and probably as affecting the oats and barley crops, to the prolongation of the excessive wet into the spring; and thirdly, to dry weather in early summer. In this particular case the influence of the autumn rainfall was obvious, but Dr. Shaw had now shown that it held equally good in the great majority of other seasons.

The question whether the average for a district had any definite meaning, to which Dr. Mill had already referred, had also been brought prominently to his notice recently in connection with the duration of the harvest. There were two ways, he thought, of expressing the mean duration of harvest in Great Britain: you might ascertain the average date of commencement and termination of harvest in each agricultural division of the country, and say that the duration of harvest in the country, as a whole, was from the earliest of these dates of commencement to the latest of the dates of termination. This answered the question: How long did harvesting operations last in Great Britain (apart from exceptionally early or late fields)? The fact was that owing to the considerable extension, in latitude, of Great Britain, corn cutting was carried on in a more or less narrow band which swept across the country from south to north, and therefore the harvest might truly be said to have lasted during the period thus ascertained. This seemed to him a perfectly legitimate way of expressing the duration; but it was not quite what was usually understood by an average, and it had the defect of not lending itself to useful comparisons of one year with another; because while the harvest in any given locality might be very quick, it might take long to sweep over the country. A corresponding statement in meteorology would be to say that the average range of temperature was between the average minimum in the north of Scotland and the average maximum of the south coast. The preferable method seemed to be to take the average of all the dates of commencement and of all the dates of termination; this was a more normal method, and would give the average duration in any district. As a matter of fact, judging from more or less trustworthy data he had seen as to the dates of the oat harvest in 1904 and 1903, the former method indicated a comparatively small difference between the two years; whereas the second alternative showed a large difference, bearing out the general impression that the harvest of 1904 had been as exceptionally rapid as that of 1903 had been protracted.

An interesting point in the presentation of statistics appeared to be raised by Table II (p. 256). It was often somewhat uncertain whether percentages or actual figures should form the basis of comparison. In this table it would be noticed that the average deviation of the rainfall, for instance, from the average was 0.34 inch in England east and 0.43 inch in Ireland south. It might therefore erroneously, he thought, be deduced that the rainfall was subject to greater fluctuations in the latter district; but owing to the considerably greater rainfall there, the average deviation, if expressed as a percentage of the mean fall, would appear to be less in Ireland south than in England east, *i.e.*, a conclusion opposite to that which would be deduced from a consideration of the actual deviations.

Mr. Hooker would also like to ask the author whether he attributed any practical value to the accumulated temperature below 42°. Of course this information was complementary to that above 42°, but did it give any practical information which could not be more readily derived from a simple consideration of the mean or minimum readings of the thermometer, &c.? The accumulated temperature above 42° was useful, because it was correlated with (not necessarily proportionate to) the growth of plants, and was in fact calculated with the object of such a comparison; but there was apparently no correlation between plant growth and the accumulated temperature below 42°, since below the datum line it was assumed that plants simply rested, not that they retrograded. It gave scarcely any indication as to whether damage was done by frost, and in view of the importance to plants of the datum 32°, he would like to ask whether any advantage would be likely to accrue from dividing the accumulated temperature into three classes, *viz.*, above 42°, between 42° and 32°, and below 32°. He did not wish to drive accumulated temperature below 42° from meteorological tables altogether, but it seemed to him that if any considerations rendered the curtailment of tables desirable, this would be the column which could best be omitted.

Major CRAIGIE desired to thank Dr. Shaw for responding to his suggestion, and opening what was virtually a new field of inquiry in that Society. To the division of the country by the Meteorological Council into "wheat-producing" and "grazing" sections he had always entertained, and had often expressed, an objection. Such a classification centred our thoughts particularly on the growth of a particular cereal, and one now so agriculturally insignificant as wheat. Of course what was meant was the essential distinction between the arable area and the grass area; but the arable area grew crops more important in the aggregate to the farmer than wheat, which covered only one-twenty-fourth part of the 48,000,000 acres cultivated in one form or another in the United Kingdom. The maps which a few years ago he took occasion to publish made it clear that the wheat area was important only in the eastern division of England, and in applying the rainfall and temperature figures given in the paper, it might be well

to consider those for that area alone in their bearing on the wheat crop. The point brought out by Dr. Shaw as to the effect of the autumn rainfall upon the crop was of course one of great interest; but the connection was to be expected, other things being equal, the condition of the soil at the autumnal seed time being a dominant factor in determining the future harvest. A wet autumn meant a bad seed bed, and therefore the wheat crop would be deficient. But he would like to see similar data applied to the spring sown crops, and to note how far the rain at a particular season had affected the yield of barley and oats. The paper now before them was replete with matter for future study.

Mr. ERNEST WOOLLEY said: As connected with canal interests, he felt to the full extent how important a subject this was. There was a popular impression that a canal bed was made, and the rain fell from heaven and filled it up; but that was a wrong impression. They had had occasion in recent years to feel a "nip" from the shortage of rain, and they had had to provide very heavy works to get water out of the ground instead of from the heavens. This paper therefore contained very valuable suggestions to canal owners as well as to the agricultural community, and he was sure he was expressing the thanks of the canal world when he thanked the reader of the paper for this valuable contribution to their knowledge. The company he was connected with had some interesting records dating a considerable way back, so that the paper was of very great interest to himself, as it was, he was sure, to them all.

Dr. SHAW, in replying, said he thought the Society had done signal service in dragging a paper on this subject out of him; by which he meant not that his own contribution was of special value, but that a discussion of the methods upon which averages are based or applied, as hinted by Dr. Mill and Mr. Hooker, was a very useful discussion with a view to the future. It was essential that averages for practical purposes should be based upon such a method that one set of data might be comparable with another. The instance that Mr. Hooker had given of the average duration of harvest was an exceedingly striking instance of the confusion that might arise from not having the methods upon which averages had been computed brought out into the daylight, and clearly stated. In this paper, which, as Major Craigie had said, had been extracted from him rather unwillingly, because he really had not had time to deal fully with the subject, he had done his best to put down clearly the statistical methods adopted in his department for land observations. The criticism that Major Craigie had made as to the nomenclature of the divisions of the country was likely to be of considerable public value if it gave rise to the free interchange of opinion as to the best method of representing such statistics. There was not time to reply in detail to all the points raised in the discussion, but he would like to say a word with respect to Mr. Thomas's suggestion that the autumn rainfall was not the dominant factor in determining the subsequent yield of wheat.

What surprised him were not the exceptions, but the agreements. Remembering that nine months had to run between the end of autumn and the beginning of harvest, and considering the influence of the intervening rainfall, sunshine and other accidents that might happen to the crop before it was gathered, it was surprising that the connection should be so close as to be expressed possibly numerically. It might be true that two other columns of figures might be tabulated which would show a closer agreement than the two columns put down in the table, but they certainly would not be columns of figures for individual elements. To take two elements out of the whole table, put them side by side, and find them to agree as they did in this case, was astonishing. Of course other influences affected wheat, and it might be that a sequence of influences was required to follow the autumn rainfall in order to bring out the corresponding result. It might be that the relation was a meteorological one, and that a dry autumn itself implied a dry spring or a dry summer, or whatever combination of circumstances was required for a good yield. He could give a certain amount of evidence in favour of the contention that a meteorological relation existed, and that it was not what took place in the autumn alone which might account for the relation, but succeeding events as well which were associated with a dry autumn. That contingency made the subject one of considerable interest, and one which must be pursued rather more fully than was possible on the present occasion. With reference to Mr. Hooker's pertinent criticisms on the computation of the values of accumulated temperature above 42° and below 42° , on the hypothesis that a temperature below 42° did nothing for a crop, it was, from an agricultural point of view, of no use to compute the aggregates. But the report had in view not only agriculture but hygiene; and the intensity of temperature below 42° , although it might not affect vegetable crops, did affect human beings very considerably.

Note. 1st April, 1905.

Professor Edgeworth's remark about the computation of mean daily values from the maximum and minimum readings, raises a question upon which meteorologists have spent a vast amount of labour, namely, the computation of true mean temperatures from two or more readings per day. The literature of the subject is too large to be dealt with in this discussion. The basis of the particular method of computation referred to is set out in the "Quarterly Weather Report" for 1878 already referred to.

The following were elected Fellows of the Society:—

Adams, W. G. S.

Leonhardt, F. von.

Azevedo, Joao Lucio de.

Muller, Osvald Valdemar, M.A.

Daugherty, Charles M.

Smith, Stanley George.

*On the PROGRESS of FRIENDLY SOCIETIES and other INSTITUTIONS
connected with the FRIENDLY SOCIETIES REGISTRY OFFICE during
the TEN YEARS 1894-1904.*

By E. W. BRABROOK, C.B., F.S.A., &c.

[Read before the Royal Statistical Society, 18th April, 1905.

SIR FRANCIS SHARP POWELL, Bart., M.P., President, in the Chair.]

ON 20th April, 1875, I had the honour of reading a paper before the Society on Friendly Societies and similar institutions. On 21st April, 1885, I read a paper on ten years' statistics of those institutions, and, incidentally, on the relation of the State to thrift. On 23rd April, 1895, I continued the record of progress for another ten years, and I now respectfully submit that which will be the last paper of the decennial series, as far as I am concerned, bringing down the statistics to the present time. I relinquish the ambition to emulate our esteemed Fellow, Sir John Glover, who has contributed five decennial papers on another important subject.

When I read my last previous paper, the Bill which afterwards became the Friendly Societies Act, 1895, was under consideration in the House of Commons; and it will be convenient first to state what were the alterations it made in the law, and what has been their statistical result. By Section 1 it required that every society assuring a certain annuity or certain superannuation, whether to a member or to any person claiming through a member, should obtain the certificate of a qualified actuary to the tables for such assurance before its rules could be registered. The requirements of the previous law related only to such annuities as are payable to members, and this extended it to persons claiming through a member, thus including widows' annuities and survivorship annuities; but like all other provisions for enforcing actuarial soundness, it has only had the negative effect of preventing applications for registry by societies that could not stand the test.

By Section 2 it provided that before a society proceeded in the courts of law to compel the Assistant-Registrar for Scotland or for Ireland to register any document, they should appeal to the Chief Registrar. There have been 6 cases of appeal to me under this section, and in no case has there been an appeal from my decision

to the courts of law. It may be taken, therefore, that this enactment has been useful in preventing litigation.

By Section 3 it prohibited the treasurer or secretary of a society from holding at the same time the office of trustee of the society.

By Section 4 it removed a difficulty that societies had experienced in paying money on the death of a member in circumstances that prevented the widow or other claimant from producing the certificate of death required by the previous Act, and enacted that in such circumstances (*viz.*, death by colliery explosion or other accident where the body cannot be found, and death which is the subject of a coroner's inquest) the certificate need not in future be produced.

Section 5 extended the privileges of friendly societies with regard to exemption from stamp duty.

Section 6 authorised payment of money on the death of a member to a nominee over 16 years of age, and provided that a nomination should be revoked by the marriage of the member.

Section 7 repealed the provisions of the Act of 1875, by which societies were divided into two classes: adult societies, having members not under 16 years of age; and juvenile societies, having members not under 3 and not over 21 years of age; and substituted a provision that any society might have members of any age over one year. The enumeration of 1899 showed that there were 1,058 juvenile societies then in existence. The disadvantages of juvenile societies under the Act of 1875 were that they could not be self managed, as that Act requires that every member of the committee of management of any society must be over 21, and that membership ceased at that age.

Every friendly society ought to be self managed, and ought to be permanent. If you exclude a member from a society on or before his attaining 21, you run great risk that he will not enter another, and you deprive him of the benefit of his share of the funds. The liability of youths to sickness is slight. Some of these juvenile societies are able accordingly to save a considerable portion of the contributions of their members. Thus succeeding members profit by a fund to which they have not contributed, and the fund is scrambled for. The only consolation is that, when all the members are gone it is nobody's money, becomes *bona vacantia*, and is claimable by the Solicitor to the Treasury. It would be infinitely better if the ordinary societies would all take advantage of this section, and admit members at any age after the minimum age of one year. They have shown a strange reluctance to do so. The adult committees of management and officers of these juvenile societies stick to their posts. They do not wish the youths to be

mixed up in meetings and otherwise with the adult members. For these and other equally insufficient reasons, many of the juvenile societies are kept in existence, and new ones even are formed.

Section 8 gave legal sanction to a practice that had grown up among the affiliated orders, and been found very advantageous, of allowing the districts to invest the money of the subordinate branches. A small lodge which accumulates its funds slowly loses interest by the difficulty of investing them; by paying them over to the district that body is able to invest them more profitably and without delay.

Section 9 related to investments by societies with the National Debt Commissioners, and incidentally had the effect of greatly increasing the amount invested. It continued the rate of 4*l.* 11*s.* 3*d.* per cent. to those old societies existing before 1828, which were entitled to interest at that rate; and the rate of 3*l.* 16*s.* $-\frac{1}{2}$ *d.* per cent. to those societies existing before 1850, which were entitled to interest at that rate; and it provided with respect to other societies existing before 1888 a rate of 3*l.* $-\text{s. } 10\text{d.}$ per cent., provided they made their first investment before 1st January, 1896.

The effect of this enactment was remarkable, as shown by the following figures, for which I am indebted to the courteous kindness of the National Debt Commissioners, as they have not elsewhere been published :—

Year Ending 20th November,	Amount Invested by Friendly Societies with the National Debt Commissioners during the Year.	Year Ending 20th November,	Amount Invested by Friendly Societies with the National Debt Commissioners during the Year.
	£		£
1887.....	4 510	1896	580,087
'88.....	7,160	'97	165,643
'89.....	6,020	'98	85,719
1890.....	6,275	'99	55,916
'91.....	1,780	1900	10,805
'92.....	3,385	'01	7,071
'93.....	9,500	'02	7,730
'94.....	3,425	'03	2,564
'95.....	20,550	'04	5,000

The sudden rush to invest in the years 1896-98, and the gradual falling off since, are very curious. Altogether 1,117 societies, established before 28th June, 1888, made applications to the National Debt Commissioners to open accounts with them and thus secure the benefit of a fixed rate of 3*l.* $-\text{s. } 10\text{d.}$ interest on all their assurances effected before that date, between the 6th July,

when the Act was passed, and the 31st December, 1895. Only 736 societies established their right to the privilege, and they deposited 232,791*l.* At the same time 22 societies opened accounts at the lower rate of 2*l.* 15*s.* per cent., and invested 5,447*l.*; making together 245,238*l.* Of this only 20,550*l.* was received in the year ending 20th November, 1895; the remaining 227,848*l.* having been paid in between the 20th November and the 31st December of that year. (See my report for 1896.)

The following is an account, with which the Commissioners have kindly furnished me, of the capital sums invested with them on 20th November, 1896, and 20th November, 1904:—

Rate of Interest per Cent. per Annum.	Number of Societies.		Amount Invested.	
	1896.	1904.	1896.	1904.
£ s. d.			£	£
4 11 3	25	21	233,233	206,835
3 16 $\frac{1}{2}$	84	56	379,895	307,970
3 - 10	909	594	925,926	800,218
2 15 -	1,018	671	1,539,054	1,315,023
	104	177	115,777	172,315
	1,122	848	1,654,831	1,487,338

The diminution in the higher rates necessarily follows on the decrease of members insured thereunder.

Section 10 extended the privilege of settling disputes between a friendly society and a member to the case of a person who had ceased to be a member for not more than six months. This extension has unfortunately been much restricted by a decision of the Court of Appeal.

Section 11 provided a simple process of amalgamation between a juvenile and an adult society, to meet the case where the adult society having availed itself of Section 7, and made rules admitting members above the age of one year, the separate existence of the juvenile society has become unnecessary. It also provided for dividing the members of a juvenile society among several adult lodges in cases where, as frequently happened, the juvenile society was connected with more than one lodge. These provisions have been adopted in 92 cases.

Section 12 removed a grievance felt by the affiliated orders where lodges or other branches that had seceded or been expelled, continued to use the name of the order after having ceased to be acknowledged as branches of it.

Section 13 simplified the operation of converting a society into a registered branch of an order by requiring the consent of a bare majority instead of two-thirds.

Section 14 extended the benefits of medical associations to members of trade unions, and provided that a contributing society or union should not withdraw from such an association without giving three months' notice.

Section 15 required any collecting society thereafter established to use the words "collecting society" as the last words of its name. This has been acted upon in the case of 40 societies.

Section 16 expressly provided that contributions to a friendly society shall not be recoverable at law.

Section 17 related only to the Island of Jersey, and corrected a clerical error in the Act of 1875.

Section 18 required every society to provide in its rules for the consequences of non-payment of any subscription or fine.

Section 19 provided for a kind of consolidation of the Acts, by printing the Act of 1875 with the corrections made by the new Act, but it was superseded by a complete consolidation in 1896.

I now proceed to bring down the tables in the former papers to the present time.

TABLE I.—*England and Wales. Rules and Amendments Registered under the Friendly Societies Acts.*

Years.	Rules.		Amendments.	Total.	Average per Annum.
	Societies.	Branches.			
1793-1855....	26,034	—	14,864	40,898	660
1855-75.....	21,875	—	25,378	47,253	2,363
'76-84.....	1,734	3,885	20,214	25,833	2,870
'85-94.....	2,816	5,035	21,303	29,154	2,915
'95	284	591	2,358	3,233	} 3,360
'96	243	412	2,417	3,072	
'97	196	298	2,598	3,092	
'98	243	332	2,777	3,352	
'99	330	418	2,833	3,581	
1900	217	386	2,349	2,952	
'01	278	389	2,453	3,120	
'02	369	383	2,538	3,290	
'03	295	460	3,755	4,510	} 3,360
'04	271	465	2,662	3,398	
	55,185	13,054	108,499	176,738	1,682

TABLE II.—*Societies under the Friendly Societies Acts. United Kingdom.*

1. NUMBER OF RETURNS.

	1891.	1899.	1903.
(a.) Friendly societies (not collecting) and branches.....	23,998	26,431	27,769
(b.) Collecting societies.....	43	46	43
(c.) Other societies under the Friendly Societies Acts	557	1,308	1,731
Total	24,598	27,785	29,543

2. NUMBER OF MEMBERS.

(a.) Friendly Societies (not collecting) and branches.....	4,203,601	5,217,261	5,672,659
(b.) Collecting societies.....	3,875,215	5,922,615	6,973,136
(c.) Other societies under the Friendly Societies Acts	241,446	610,254	768,387
Total	8,320,262	11,750,130	13,414,182

3. AMOUNT OF FUNDS.

	£	£	£
(a.) Friendly societies (not collecting) and branches.....	22,695,039	32,751,869	38,426,477
(b.) Collecting societies.....	2,713,214	5,207,686	7,220,932
(c.) Other societies under the Friendly Societies Acts	594,808	1,528,064	2,018,709
Total	26,003,061	39,487,619	47,666,118

The figures for 1891 are from the latest available returns: those for 1899 and 1903 are for the year ending 31st December in each case. The increase shown during the last four years is $1\frac{1}{2}$ per cent. per annum in the number of societies, $3\frac{1}{2}$ per cent. in the number of members, and 5 per cent. in the amount of funds. For the whole period the increase is somewhat greater— $1\frac{5}{8}$ per cent. per annum in the number of societies, 5 per cent. in the number of members, and 7 per cent. in the amount of funds. The increase may be partly accounted for by the greater completeness and up-to-dateness of the later returns, a matter in which much progress has been made towards perfection. The amount of funds per member was in the non-collecting societies under the 1891 return, 5*l.* 8*s.*; it increased in 1899 to 6*l.* 5*s.* 6*d.*, and in 1903 to 6*l.* 15*s.* 6*d.* In the collecting societies it was 14*s.*; it increased in 1899 to 17*s.* 7*d.*, and in 1903 to 1*l.* -8*s.* 8*d.* In the other miscel-

laneous societies it remains about the same, having been 2*l.* 9*s.* 3*d.* in 1891, 2*l.* 9*s.* 9*d.* in 1899, and 2*l.* 12*s.* 6*d.* in 1903.

It will thus be seen that while the amount of funds per member has increased in the non-collecting societies by 20 per cent., in the collecting societies it has increased as much as 48 per cent. This is satisfactory in both respects. There has been a great increase in the number of members in both classes of society which would have had a tendency to reduce the average of accumulated funds, unless there had been a strong effort on the part of the societies to strengthen their position. Such an effort was especially called for on the part of the collecting societies, and it is satisfactory to see that they have responded to the call. On the other hand, it is to be remembered that during the period 40 collecting societies have been registered, and an equal number have gone out of existence, having been established rather to provide pay for the collectors and managers than for any more useful purpose.

The number of valuations of assets and liabilities received in each quinquennium shows a steady increase, as follows :—

1885-89	13,248	1895-99	17,066
'90-94	15,631	1900-04	17,494

It is not possible to draw any precise conclusions from the comparative results of the whole group of valuations, inasmuch as they proceed upon various principles of calculation, but it may be stated in general terms that they show on the whole an improvement in the financial condition of the societies. An example of this may be taken from Messrs. Watson's report on the Seventh Quinquennial Valuation of the Lodges of the Manchester Unity of Oddfellows, in which a comparative view of the results of the seven valuations is given, from which I extract the last three :—

Date of Valuation.	Present Value of Benefits.	Present Value of Assets.	Total Deficiency.	Total Surplus.	Percentage of Assets to Liabilities.
	£	£	£	£	
1889-91.....	17,575,003	16,943,738	1,333,343	702,078	96·4
'94-96.....	19,947,990	19,485,586	1,307,621	845,217	97·7
'99-1902....	22,738,174	22,771,520	1,033,456	1,066,802	100·15

Taking the aggregate of all the lodges of this great Order into consideration, we observe that they have bettered their condition by nearly 500,000*l.* in the interval between the last two valuations. For the first time in its history the lodges having a surplus exceed those having a deficiency both in number and

amount. This result is due to the wise measures taken by the Order at its Annual Movable Conference and by the Board of Directors to strengthen the resources of the lodges. There still remains much to be done to meet the deficiency which exists in nearly half the lodges of the Unity, but the progress hitherto made shows that the goal of actuarial solvency for every lodge will be reached in time.

The problem of the valuation of sickness liabilities in friendly societies is not, however, so simple as that of the valuation of life assurance benefits. I have been furnished by Mr. Leveaux with particulars derived from the valuations made in the year 1902, from which it appears that there are great divergencies in the actual sickness experienced by societies from that calculated as probable in the tables used by the valuers. For example, in 12 societies in the county of Merioneth, having 2,110 members, the sickness allowed for by the tables would have cost 6,006*l.*; the actual cost to the society was only 3,777*l.*, or 37 per cent. less. On the other hand, in 115 societies in the county of Glamorgan, having 14,267 members, the actual cost of sick pay was 53,778*l.*, or 44 per cent. more than 37,267*l.*, the expected amount. The case of 14 societies in Monmouth, having 4,571 members, was even worse, for the tables provided for 8,459*l.* sickness only, while the sickness allowance actually paid was 13,861*l.*, or 64 per cent. more. It is curious that, notwithstanding these wide divergencies of societies, the general result of the whole 2,077 societies approximated very closely to the expectation, for the aggregate of the expected cost of sickness was 1,354,911*l.*, and the actual cost incurred was 1,400,681*l.*, or only 3 per cent. in excess. This is an interesting illustration of the statistical law that on a broad average divergencies will neutralise each other; but it is at the same time a striking lesson to societies, enforcing upon them the necessity of constant vigilance and supervision. A favourable result of one valuation may be altogether neutralised by excessive claims for sickness during a subsequent period. It may also serve as a just encouragement to societies that have, through excessive claims for sickness, been placed in the position of having a deficiency of funds, in their efforts to work out their own redemption by reducing those claims, inasmuch as it shows that no case of the kind need be considered as altogether hopeless.

For further interesting statistics relating to friendly societies I refer to Appendix K to my report for 1900; but as they were then published for the first time, previous returns are not available for comparison, and I do not insert them here.

Workmen's Compensation Schemes.

As these are the creatures of the Act of 1897, they belong wholly to the decade under consideration, and have been so ably dealt with by Mr. W. H. Tozer in his recent paper, that I need only give the figures brought down to the present time, with which he has supplied me.

These are :—

Schemes	54
Number of members	117,619
Amount of funds	£181,432

I am also indebted to Mr. Tozer for kindly verifying the figures in this paper, and to my successor in office, Mr. J. D. Stuart Sim, for permission to use in it statistical facts that have not yet been published in official reports. It will be observed that certified schemes cover a small portion only of the field of employment affected by the Acts.

Trade Unions.

The following tables show the progress of trade unions :—

TABLE III.
ENGLAND AND WALES.

	1883.	1893.	1903.
Number of trade unions on register	210	481	598
Number of trade unions making returns	134	464	588
Number of members	249,653	1,034,662	1,505,861
Annual income	£358,286	£1,733,539	£2,333,733
Funds at end of year	£529,587	£1,310,234	£5,039,993
.. per member	£2 2s. 5d.	£1 5s. 4d.	£3 6s. 11d.

SCOTLAND.

Unions	14	40	38
Returns	11	40	38
Members	12,940	37,873	58,515
Income	£12,394	£47,685	£88,976
Funds	£16,891	£56,849	£201,938
Per member	£1 6s. 1d.	£1 10s.	£3 9s.

IRELAND.

Unions	22	62	106
Returns	16	38	46
Members	3,160	7,930	10,999
Income	£7,697	£8,973	£17,025
Funds	£3,088	£10,924	£18,255
Per member	19s. 7d.	£1 7s. 6d.	£1 13s. 2d.

TABLE IV.

UNITED KINGDOM.

	1883.	1893.	1903.
Unions	246	583	742
Returns.....	190	542	672
Members	265,753	1,080,465	1,575,375
Income	£378,377	£1,790,197	£2,439,734
Funds	£549,566	£1,378,007	£5,260,186
Per member	£2 1s. 4d.	£1 5s. 6d.	£3 6s. 9d.

The most important event in the history of trade unions during the ten years has been the decision in the Taff Vale case, which has imposed upon the funds of the unions an unexpected responsibility for the acts of their officers.

In discussing my paper of 1895, our distinguished Fellow, Mr. A. H. Bailey, observed that "trade unions were not provident institutions." I venture, with great deference, to suggest that this is a narrow view to take of their operations. Far the larger portion of the 2,000,000*l.* which they dispense every year is given to members in sickness, accident, old age, and temporary lack of employment. The amount expended on strikes is small in comparison with that which is devoted to ordinary relief. It is true that as they only keep a little more than two years' income in hand they compare unfavourably with the friendly societies, who have more than twice that amount accumulated; but that is compensated for by their system of levies, and by the fact that their organisation enables them to exact larger contributions from members, and to secure a succession of young members.

A return recently published by the Board of Trade relating to the 100 largest trade unions illustrates this point. In the year 1903, out of 1,468,036*l.* granted in benefits, 791,404*l.* or 54 per cent. was for ordinary friendly society benefits, 504,214*l.* or 34 per cent. was for relief to unemployed members, and only 172,418*l.* or less than 12 per cent. was for dispute benefits. As the latter amount fluctuates very much from year to year, and in that particular year was very low, it may be well to state also the average of the twelve years 1892 to 1903, which is as follows:—

	£
Friendly society benefits	611,685, or 49 per cent.
Unemployed benefits	347,455, „ 28 „
Dispute benefits	280,002, „ less than 23 per cent.
Total.....	<u>1,239,142</u>

In other words, during the twelve years in question these 100 trade unions had exercised the functions of ordinary friendly societies to the extent of 7,340,216*l.*, and had given as benefit to the unemployed, which friendly societies cannot give, 4,169,459*l.*

Building Societies.

At the date of my paper of April, 1895, the Building Societies Act, 1894, had only come into operation on the 1st January previous to the reading of the paper, and no particulars could be given of its working. It will be convenient first to state what were the alterations it made in the law, and what has been their statistical result.

By Section 1 it required new societies and societies completely amending rules, to furnish tables of withdrawal and redemption where applicable, to limit the amount of their preferential shares, if any, and to provide for losses and for the manner in which membership is to cease. This section has been acted upon by 268 new societies, and by 270 societies amending their rules.

By Section 2 it provided for the use of a form of account to be prescribed by the Chief Registrar with the approval of the Secretary of State. This section imposed on me the very difficult task of settling a form of return that would disclose the whole of the proceedings of the society during the year, a matter which is comparatively simple when you are dealing with an ordinary trading concern, but which becomes more complicated when you have to deal with a society of variable capital. The form I prepared was subjected to very severe criticism; but it has survived it, and has been in practical use now for ten years, and has been found to be satisfactory. The Act contemplated the possibility that a variety of forms might be found to be necessary, having regard to the great variety of the methods of procedure of various classes of building societies; but that necessity has fortunately been avoided, and the one form has been filled up by all societies. It has also been voluntarily filled up every year by 42 out of the 62 unincorporated societies which are still under the Act of 1836, and are permitted by law to furnish a statement of account in any form of their own.

This section also required additional schedules to be furnished by every incorporated society relating to (1) the number and total amount of the society's mortgages on each of which the present debt exceeds 5,000*l.*; (2) the aggregate amount included in the society's assets in respect of properties twelve months in possession; and (3) the aggregate of the present debts in the case of mortgages where the repayments are more than twelve months in arrear. On

this a well-informed writer in the "Economist" of 7th January, 1905, observes: "The object of the schedules is obvious. The first indicates cases in which a society has, perhaps rashly, advanced large sums on individual properties. The second and third indicate the cases where the borrower has been unable or unwilling to continue his repayments—usually because the mortgaged property is worth less than the amount owing—and a property of doubtful value has thus passed, or is about to pass, into the hands of the society, though probably figuring among its assets on the basis of the value at which it was originally entered. Naturally some difference of opinion was expressed when the Act of 1894 was under discussion as to whether these particulars were adequate for the end in view. Experience, however, seems to show that the second and third schedules, at all events, have a real value, as the societies which fail, and fail most disastrously, are usually those which have the largest amount of properties in possession and of mortgages on which the repayments are in arrear. If this is borne in mind, the improvement shown by the following figures will appear very satisfactory :—

Specially Scheduled Assets.

	1897.	1903.
1. Large mortgages	£1,992,000	£2,067,000
Percentage to total assets	5	4
2. Properties in possession	£4,776,000	£2,397,000
3. Mortgages in arrear	£332,000	£195,000
Percentage of (2) and (3) to total assets..... }	13	5 "

The improvement is even greater than appears, for there is reason to think that in 1892 the properties in possession were not less than $7\frac{1}{2}$ millions.

By Section 3 one of the auditors of every society was required to be a professional accountant. Previously the audit had to be conducted by two members, and unless a professional accountant was a member of the society, he was incapable of acting as auditor.

By Section 4 provision was made for an inspection of the books of a society by an accountant or actuary to be appointed by the Registrar on the application of twelve members. This has only been acted upon in three cases.

By Section 5 authority was given to the Registrar (*a*) to appoint an inspector to examine into the affairs of a society, with power to take evidence on oath, and to require production of books and documents, or (*b*) to call a special meeting of a society in cases

where 100 members (or one-tenth of the whole number if less than 1,000) apply to the Registrar to do so, or where the Registrar is satisfied from a default of the society or from other evidence that he ought to do so. This, it should be observed, is a more extensive power than is vested in the Registrar under any other Act of Parliament, and it has been used in thirteen cases with excellent effect, having enabled a complete investigation to be made into several cases of fraud. It may be worthy of consideration whether it should not be extended to other societies, such as those under the Collecting Societies Act, 1896.

By Section 6 power was given to the Registrar to cancel registry in certain cases. Under this the registry of 893 societies has been cancelled, mostly upon the ground that they have ceased to exist.

By Section 7 power was given to the Registrar to dissolve a society upon the application of a competent number of members, if upon investigation he finds it expedient to do so; and in that case he is to direct in what manner the affairs of the society are to be wound up. These powers have been exercised in six cases, and have involved the undertaking by the Registrar of many difficult functions in the course of carrying out his directions.

By Section 8 the provisions of the Companies Acts were applied to societies, and Section 9 was a declaratory enactment, saving the legal constitution of a society until the termination of dissolution. Section 10 reversed a decision of the law courts which imposed oppressive conditions upon borrowers in case of dissolution.

Section 11 provided for returns of dissolution to be made to the Registrar. The following returns have been received:—

Years.	Societies.		Shareholders.	
	Dissolved	Returns.	Due	Paid.
			£	£
1895	129	92	262,103	203,791
'96 ..	118	106	479,455	376,704
'97 ..	130	120	422,351	357,078
'98 ..	123	113	294,229	261,036
'99 ..	99	95	304,875	262,794
1900 ..	98	92	309,045	288,915
'01 ..	98	91	649,839	583,053
'02 ..	77	67	322,884	283,206
'03 ..	88	83	344,599	343,569
	960	859	3,389,380	2,960,238

Years.	Creditors.		Assets.		Expenses of Dissolution.
	Due.	Paid.	Estimate.	Realised.	
	£	£	£	£	£
1895	36,473	34,748	288,070	256,150	17,611
'96	5,335	5,111	477,711	407,568	25,753
'97	71,344	66,468	491,981	460,027	36,481
'98	239,628	162,473	544,208	445,150	21,641
'99	28,376	15,232	306,933	298,885	20,859
1900	24,220	24,220	328,914	331,425	18,290
'01	136,260	136,260	722,126	752,874	33,559
'02	48,557	48,557	356,503	352,840	20,987
'03	10,291	10,291	374,161	376,950	23,090
	600,484	503,360	3,890,607	3,681,869	218,271

Of the societies dissolved about 70 per cent. were terminating, and the remainder permanent. Upon the gross result of the dissolutions, the depositors and other creditors seem to have lost 97,124*l.*, and the shareholders, 429,142*l.*, or a little over 2*s.* 6*d.* in the £. The expenses of dissolution have amounted to almost exactly 6 per cent. of the amount of assets realised.

Section 12 prohibited for future societies the practice of balloting for advances, which had given rise to a species of gambling traffic. Incidentally, it put a stop to the creation of societies for granting advances without interest on the Starr-Bowkett principle. The societies constituted since 1894 have either granted their advances by rotation or by sale. Provision was made for existing societies to discontinue advances by ballot, but there have been only three cases in which that provision has been acted upon.

By Section 13 advances on second mortgage were prohibited, with a saving clause for existing societies in Scotland and Ireland.

By Section 14 the borrowing power of societies was further limited to the extent that mortgages twelve months in arrear, and properties twelve months in possession, are not to be counted in calculating the limit.

By Section 15 societies were not to accept deposits except upon condition of one month's notice before repayment or withdrawal.

By Section 16 societies were allowed to invest, to a limited extent, in savings banks.

By Section 17 their powers of investment were extended to any trustee security.

By Section 18 facilities were provided for proceedings against societies.

By Section 19 the consents required for union of societies, or transfer of engagements, were more clearly defined.

By Section 20 the compulsion to state a case, arising out of some decisions under the Arbitration Act, was removed, with the view of preventing litigation.

Sections 22 to 24 facilitated procedure.

By Section 25 all societies established after 1856 were required before August, 1894, to become incorporated under the Acts of 1874 to 1894, and those not incorporated were required to make returns. The following is a summary of those returns for England and Wales:—

Years.	Number of Societies.	Number of Returns.	Number of Members.	Amount Received during Year.	
				£	
1895	990	230	73,191	14,457,450	
'96	304	71	35,859	16,057,063	
'97	81	76	41,036	20,786,538	
'98	77	70	51,668	20,239,667	
'99	73	65	51,771	19,421,975	
1900	70	68	53,426	19,624,310	
'01	68	66	54,219	17,565,181	
'02	67	65	55,779	19,871,684	
'03	62	62	54,155	21,335,683	

Years.	Liabilities.			Assets.		
	Members.	Creditors.	Profit.	Mortgages.	Other Assets.	Loss.
	£	£	£	£	£	£
1895	5,036,088	7,223,280	817,213	5,399,898	7,672,917	3,257
'96	2,968,364	7,852,985	602,380	2,782,639	8,640,244	846
'97	3,139,858	8,807,719	643,017	3,051,754	9,543,410	430
'98	3,257,025	10,109,445	683,783	3,170,419	10,879,303	531
'99	3,460,790	10,832,145	731,908	3,444,519	11,579,738	586
1900	3,586,033	9,712,060	762,938	3,344,781	10,715,656	594
'01	3,656,476	9,790,155	792,000	3,510,782	10,721,145	704
'02	3,758,807	10,177,500	815,836	3,513,926	11,237,232	985
'03	3,584,774	10,533,155	830,853	3,291,221	11,655,948	1,613

The large initial figure of 990 societies includes many that on inquiry were found to have terminated or been dissolved, the Act of 1836 not having provided for any notice to the Registrar of dissolution or termination. A rapid diminution in the number of societies in the earlier years, followed by a continuous slight diminution in later years, will be observed. This is due to the societies becoming incorporated and passing over to the list of incorporated societies, at first compulsorily, where they were societies established after 1856, and afterwards voluntarily, as they began more fully to perceive the advantages of incorporation. It will also be observed that these old societies complied more and more fully with this new requirement of sending in returns, until in 1903 the returns were absolutely complete. The great excess of liabilities

to creditors and other assets over liabilities to members and mortgages will also be noticed. This is due to the inclusion in the returns of one great exceptional society, the Birkbeck, and its companion, the Second Birkbeck; apart from which the returns of the 60 other societies for 1903 show—members, 33,967; receipts, 996,580*l.*; and liabilities and assets as follows:—

	£		£
To holders of shares.....	1,622,128	Mortgages	2,337,912
„ depositors and other }	663,245	Other assets	163,296
creditors		Loss (in three societies)	1,613
Profit (in 57 societies)	217,448		
	<u>2,502,821</u>		<u>2,502,821</u>

The amount advanced on mortgage in 1903 by these societies was 497,094*l.*, and by the Birkbeck 134,080*l.*, making together 631,174*l.*

Section 26 required the Registrar to use forms of certificate expressly stating that the incorporation of a society or the registry of rules or alterations does not imply any approval by the Registrar, or any guarantee of the good management or financial stability of the society.

Section 27 required the Chief Registrar to make a separate annual report upon building societies.

It was mentioned in my paper of 1895 that incorporated building societies reached their highest point in 1890, when the funds of those in England and Wales amounted to 50,778,797*l.* That was followed by a rapid decline, consequent upon the failure of the Liberator Building Society. The following table shows the comparative results of the returns for the last ten years:—

TABLE V.—*Incorporated Societies. United Kingdom.*

	Return of 1894.	Return of 1904.	Difference.
			Per cent.
Number of societies returned	2,597	2,062	— 10
„ members „	397,895	547,049	+ 37
	£	£	
Annual receipts.....	17,319,114	19,399,183	+ 12
	£	£	
Liabilities to shareholders	31,033,096	34,727,955	+ 12
„ depositors and }	11,490,581	13,628,329	+ 19
creditors			
Total liabilities	42,523,677	48,356,284	+ 14
	£	£	
Mortgages	40,546,929	48,105,759	+ 19
Other assets	3,867,186	3,144,299	— 19
Total assets.....	44,414,115	51,250,058	+ 15

These results are affected by the fact that in the ten years many old societies have become incorporated.

The following table relates to all building societies whether incorporated or not. The comparison cannot be carried back further than 1895, as unincorporated societies did not make returns before that date.

TABLE VI.—*United Kingdom.*

	1895.	1903.	Difference.
Number of returns	2,625	2,124	Per cent. — 19
„ members	637,655	601,204	— 6
	£	£	
Amount received	29,853,449	40,734,866	+ 36
Due to holders of shares	35,165,641	38,312,729	+ 9
„ depositors and other	17,718,606	24,161,484	+ 36
creditors	3,074,881	3,836,273	+ 25
Undivided profit	55,959,128	66,310,486	+ 18
	£	£	
Mortgages	43,866,031	51,396,980	+ 17
Other assets	11,693,155	14,800,247	+ 27
Balances deficit	399,542	113,259	— 72
	55,959,128	66,310,486	+ 18
	£	£	
Large mortgages	1,302,791	2,067,260	+ 59
Properties in possession	2,752,542	2,488,352	— 10
Mortgages in arrear	353,463	196,564	— 44

These percentages of increase and decrease are not wholly to be relied on, but they indicate the trend of events, and give evidence of considerable progress. The amount advanced on mortgage each year has been recorded in recent years as follows:—

	£	£	£
1901	9,119,775	1902	9,059,822
		1903	9,959,555

Industrial and Provident Societies.

Here there has been no legislation since 1893, when the Acts were consolidated, except two short Acts, 1894 and 1895, on matters of unimportant detail. The Act of 1893 enlarged the definition of societies that might be registered under it from “a Society for carrying on any labour, trade, or handicraft” to “a Society for carrying on any industries, trades or businesses.”

This has encouraged the formation of societies for businesses outside the ordinary co-operative movement. The following table relates to the ordinary co-operative societies, exclusive of those outside societies.

TABLE VII.—*England and Wales.*

	1893.	1903.
Number of societies making returns	1,333	1,456
„ members	1,057,816	1,706,688
Increase of members during the year	34,330	84,036
	£	£
Amount of share capital paid up	12,666,533	23,035,332
Sale of goods during the year	39,085,246	69,414,328
Stock in trade	4,518,132	7,799,197
Net profit of the year	3,497,257	6,935,714
Amount applied to educational } purposes	29,151	64,797
Investments other than in trade	5,542,113	16,015,928
Trade charges	2,373,908	5,326,633

1,027 of the societies give credit, and 363 do not; where given, it is strictly limited in extent.

SCOTLAND.

	1893.	1903.
Number of societies	346	308
„ members	204,826	333,453
	£	£
Share capital	1,831,875	3,971,511
Sales of goods	9,758,788	18,739,263
Stock in trade	1,242,940	2,136,257
Net profits	962,581	2,227,033
Applied to educational purposes	3,526	12,830
Investments other than in trade	803,776	4,314,293
Trade charges	491,558	1,634,241

IRELAND.

Number of societies	39	322
„ members	3,338	51,837
	£	£
Share capital	20,330	129,894
Sales of goods	207,002	1,428,396
Stock in trade	3,790	45,866
Net profits	3,555	15,735
Investments other than in trade	13,560	127,637
Trade charges	6,563	127,466

TABLE VIII.—*United Kingdom.*

	1893.	1903.	Increase per Cent.
Number of societies	1,831	2,086	14
„ members	1,278,589	2,091,978	64
	£	£	
Share capital	14,766,161	27,136,737	84
Sales of goods	49,150,055	89,581,987	82
Stock in trade	5,794,862	9,981,320	72
Net profits	4,448,313	9,179,482	106
Applied to educational purposes	32,677	77,627	138
Investments other than in trade	6,359,449	20,458,358	222
Trade charges	2,872,029	7,088,340	147

The most striking feature in these returns is the immense increase in Ireland. The movement there had hardly began in 1893; by 1903 the societies have increased eightfold, their members are seventeen times as many, their share capital has multiplied sixfold, and their sales sevenfold.

This is mainly due to the excellent movement promoted by Sir Horace Plunkett for the establishment of co-operative creameries and agricultural organisation.

The following are particulars of the land societies registered under the Act:—

TABLE IX.—*United Kingdom.*

	1893.	1903.	Increase per Cent.
Number of societies	84	129	54
„ members	9,200	17,133	76
	£	£	
Receipts on account of land sold	31,065	21,726	} 179
Other receipts	99,019	341,146	
Management	19,879	9,196	— 54
Share capital	247,423	526,288	113
Liabilities to creditors	264,393	580,601	120
Balances of profit	29,319	72,004	} net
„ loss	4,399	29,485	
Land and mortgages	474,563	856,152	} 102
Other assets	62,173	293,256	

The following are particulars of societies for carrying on miscellaneous businesses, and are given separately, as they are for the most part outside the general co-operative movement:—

TABLE X.—*United Kingdom.*

	1893.	1903.	Increase per Cent.
Number of societies	29	245	743
„ members	2,989	62,531	1,992
	£	£	
Total receipts	1,435,806	2,135,062	49
„ expenditure	1,430,138	2,143,926	50
Liabilities to holders of shares....	—	237,493	—
„ creditors	—	486,560	—
Assets	—	816,214	—
Balances of profit and reserve....	—	103,788	—
„ loss	—	11,627	—

The aggregate number of members in societies under the Industrial and Provident Societies Act on 31st December, 1903, was 2,171,642, and the total assets 45,369,891*l.*, showing an increase during the ten years of about cent. per cent.

Loan Societies under the Act of 1840.

This Act applies to England and Wales only. The following table gives particulars relating to societies certified under it:—

TABLE XI.

	1893.	1903.
Number making returns	349	255
„ of members	40,290	33,590
„ „ applications for loans	73,981	56,709
„ „ loans granted	65,017	53,884
	£	£
Amount of loans granted during year	358,737	317,988
„ received for interest and } fees	19,525	19,931
Amount of expenses of management	10,847	10,745
„ „ net profit of year	13,306	12,562
„ „ share capital	277,082	200,156
„ „ due to depositors and } other creditors		46,726
Amount due from borrowers	256,139	207,879
„ of other assets	—	50,424
Balances of profit	—	12,395
„ loss	—	974
Summonses issued	3,081	2,109
	£	£
To recover	7,500	4,767
Distress warrants issued	383	314
	£	£
Amount recovered	5,245	2,805
Costs not recovered from borrowers	292	269

It will be observed that the business of these societies is still gradually diminishing.

Railway Savings Banks.

These are established under private Acts of Parliament:—

	1893.	1903.	Increase per Cent.
Number of banks	12	17	42
	£	£	
Total due to depositors	2,074,375	5,024,146	142
Number of deposit accounts	25,459	56,027	120
	£	£	
Average amount of each account	81	90	11
Number of deposits during } the year	137,702	333,799	142
Number of withdrawals	17,983	42,492	136
	£	£	
Excess of deposits over with- } drawals	155,297	65,503	— 58
Interest added	75,862	181,990	140
Rate of interest	3·88	3·71	— 4

Trustee Savings Banks.

The following are the particulars relating to these institutions:—

TABLE XII.—*United Kingdom.*

	20th November, 1893.	20th November, 1903.	Increase per Cent.
Number of banks	267	228	— 15
“ having special invest- } ment departments	16	14	— 12·5
Number of depositors	1,471,146	1,687,661	15
	£	£	
Due for ordinary deposits	42,225,801	52,540,339	24
Investments in stock for de- } positors	1,318,938	2,098,359	59
Special investments of depositors	4,309,464	4,531,102	5
Stock bought for special investors	224,689	133,511	— 41
Total cash due to depositors	46,535,265	57,071,441	23
Stock due to depositors	1,543,627	2,231,870	45
Aggregate of cash and stock	48,078,892	59,303,311	23

From this it appears that, although 39 banks have been closed during the ten years since 1893, the remaining banks have so increased their business that the deposits in 228 banks are 23 per cent. more now than in 267 banks then.

Post Office Savings Bank.

The deposits and investments in stock standing to the credit of depositors in the Post Office Savings Bank with the National Debt Commissioners were as follows :—

	16th March, 1895.	4th February, 1905.	Increase per Cent.
	£	£	
Deposits	92,461,601	149,425,961	62
Investments in stock	7,073,406	17,502,619	147
	99,535,007	166,928,580	68

General Summary.

The total of the funds of the several classes of institutions on the 31st December, 1903 (or other date referred to in certain cases), was :—

	£
Societies under the Friendly Societies Acts.....	47,666,118
Workmen's compensation schemes	181,432
Trade unions.....	5,260,186
Building societies.....	66,197,227
Industrial and provident societies	45,369,891
Loan societies	258,303
Railway savings banks.....	5,024,146
Trustee „	59,303,311
Post office „	166,928,580
Total	396,189,194

A comparison of these figures with those of the 1895 paper shows the following increase :—

	During the Period Reviewed.	Average per Annum
	£	£
Societies under the Friendly } Societies Acts and Workmen's } Compensation Schemes	19,347,304	1,934,730
Trade unions	3,882,179	388,218
Building societies	10,638,041	1,329,755
Industrial and provident societies ..	23,091,009	2,309,101
Railway savings banks	2,949,771	294,977
Trustee „ „	11,224,419	1,122,442
Post Office Savings Bank	67,393,573	6,739,357
	138,526,296	14,118,580
Less decrease in loan societies	48,260	4,826
Net increase	138,478,036	14,113,754

When the comparison is extended over the whole period dealt with in these four papers, we find an apparent increase in the funds of friendly societies in England and Wales of 850,000*l.* a year over twenty-six years; in the capital of industrial and provident societies of 1,000,000*l.* a year over thirty-nine years; in the deposits in trustee savings banks of 350,000*l.* a year over thirty-eight years; in the Post Office Savings Bank of 4,000,000*l.* a year over forty years; and a decrease in loan societies of 6,000*l.* a year over twenty-nine years. The inference from these figures (apart from the necessary qualifications arising from defective returns and other like causes) is that, for a long series of years, the invested wealth represented by those institutions of which the Friendly Societies Registry takes cognisance (other than the Post Office Savings Bank) has increased at an average rate of more than 2 millions sterling per annum. This conclusion harmonises with all the other evidence we possess of the great and growing prosperity of the country under the sway of those economic principles of freedom, frugality, and peace which our wisest statesmen have proclaimed, and have left to us as an inalienable legacy.

DISCUSSION *on* MR. E. W. BRABROOK'S PAPER.

THE PRESIDENT said, as an old Member of Parliament, that it was to him a source of gratification to find that in the judgment of so competent an authority as Mr. Brabrook the labours of the legislature had not been in vain; and it was still more gratifying to find that the working classes—for members of friendly societies were, for the most part, of the working class—were worthy of their position as Englishmen, they having shown in the management of these societies intelligence, perseverance and self-denial worthy of the greatest praise. As to the work done by the societies in the way of benefits, as distinguished from aid to the unemployed, Mr. Brabrook's figures showed that in twelve years 7,340,000*l.* had been spent in ordinary benefits and 4,000,000*l.* for the service of the unemployed; and that, therefore, the work of the societies had been largely of a beneficial character, apart from any question as between employer and employed. It was also gratifying to find that the extension which had taken place in Great Britain had extended to Ireland, and that, owing to the exertions of Sir Horace Plunkett and other agencies, the mind of the Irish people had been devoted to co-operative effort.

Mr. LOCH pointed out that while the number of members in friendly societies (not collecting) and branches had increased from 5,217,261 to 5,672,659 in the period between 1899 and 1903, in the collecting societies the increase had been over a million, from 5,922,615 to 6,973,136, a fact which seemed to suggest that the collecting society was more attractive than the friendly society not collecting and with branches. That might indicate that the society of the industrial type, or of the slate club type, such as sharing-out societies, were exercising an undue influence on the minds of those who would otherwise become members of the larger friendly societies. The question also arose as to whether the increase in the first class of nearly 400,000 was to be considered a fairly large increase. Having regard to the enormous importance of the movement, one was rather inclined to think that this generation had not rallied to its friendly societies as their predecessors did; but figures were not available to show that, as a comparison between 1881 and 1899 could not be taken as the equivalent of a comparison between 1899 and 1903. Another important question was whether the friendly society which was not a collecting society, but one managed really in the spirit of friendship as a society for mutual aid, had held its own against the insurance societies and other new engines of thrift now at work for the benefit of the public. Being himself an ardent supporter of friendly societies, and an honorary member of two lodges, he would like to have some light thrown upon these questions.

With regard to the unequal incidence of sickness in different districts, one would like to know whether that was due to administration or to the prevalence of sickness in particular areas, and he imagined that such a point would be of immense importance from a statistical and actuarial point of view. It had often been stated that it would be of great service to the country to have sickness returns which might be compared with mortality returns. There was a large organisation for the express purpose of meeting distress in time of sickness on insurance lines, and it had occurred to him that if its sickness could be tabulated so as to show what kind of sickness prevailed at particular times and places, valuable data might be obtained which could not be provided from any other source.

Another important question was connected with the expansion of friendly societies to meet new needs. It was remarkable how the trades unions dealt with their unemployed by the levy system. Want of employment was of course a standing difficulty, and practically a man would insure through his friendly society on the one hand against sickness, and to a certain extent for old age, and on the other hand against want of employment. He should like to know if any other needs of the working man were also being met through the friendly society movement. He would also like to ask whether, considering the very low rates of interest now prevailing, there would be any desire on the part of those interested in friendly societies to go back to the time when a guaranteed percentage was permitted by the Government to their

invested funds. A higher percentage would, of course, make the whole system of insurance much more easy, and for the general good of the country some might think that it might be allowed. In England, happily, the subsidy system had been avoided, and he presumed that Mr. Brabrook would entirely approve of that, but it was in that way, he understood, that in France increased efforts were now being made to help the friendly societies. He did not himself advocate that friendly societies should be allowed a higher rate of interest, but as the suggestion had been made from time to time, he would like to have the opinion of those interested as to its desirability.

Mr. BAILEY said that sickness from the Friendly Society point of view was very different from sickness from the medical point of point. In the friendly societies' view sickness was anything which prevented a man following his ordinary occupation. For instance, a bricklayer's labourer suffering from rheumatism or lumbago could not carry a hod of bricks up a ladder, though he might be able to follow a sedentary occupation; that was the difficulty of estimating liabilities under sickness policies. He thought it better, therefore, that sickness should be treated in the same way as marine and fire insurance risks; that the premiums of the year should provide for the claims and expenses of the year, anything over being profit. Any attempt to estimate a reserve must be a failure.

Mr. LINGSTROM (Secretary of the North London District of Oddfellows, Manchester Unity) said he should attribute the increase in collecting societies as compared with other friendly societies to the fact that they had a large number of juvenile members; as the collector, in going from house to house, got a large number of children's assurances. Friendly societies, as he understood the term, required adult membership. With reference to the increase of friendly societies during the last year or two, he had not been at all satisfied with the results. In the Manchester Unity the decrease in the rate of increase had been very great. Three years ago the annual increase was 14,000 or 15,000; the year before last it was 7,000, and last year 2,800. The decrease was attributable to one or two things: undoubtedly workmen were very much poorer now, and in times of distress the first thing that went was the friendly society, as naturally boots and food for the children came before a man's provision for the future. Then, again, the advertisements of the slate clubs and other societies had done a great deal of injury, not to the old friendly societies, but to the workmen. As he pointed out in a letter to the *Guardian* the other day, no professional man would hazard his assurance by trying to eat it up at the end of the year, and why should a workman? It was only for want of a better understanding of these things. He did not know of any tabulation of the quality of sickness, but the duration of sickness was tabulated for each branch in his district. If Mr. Loch liked, he could have the tabulation for the 44,000 members spread over the whole of North and South London, and

he believed it was kept throughout the Unity. As far as London was concerned, there was a great deal of old age sickness that had to be met, and the Oddfellows were meeting it loyally. Though this was a heavy drain, it had not affected the societies' stability, which had during the past ten years been rapidly advancing towards complete solvency. In his own district the surpluses amounted to 43,905*l.*, and the deficiencies to 12,676*l.* With reference to the interest question, he believed that friendly societies of the type he represented would prefer to be left alone. A large amount of their property, in London at all events, was on mortgage at good rates of interest, and when it was considered that the Manchester Unity possessed 1,200,000*l.* of invested capital, and that this large business was managed by workmen during their leisure time in the evenings (he himself being the only man in his district who gave the whole of his time), he thought it reflected the highest credit on their financial ability and power of investing their own funds safely. He hoped the day would be distant when the friendly societies would have any subsidy.

Mr. CHIOZZA MONEY, after paying a tribute to the author of the paper, observed that Mr. Brabrook had dwelt on the provident side of trade unions, and he thought it was not generally realised how great a debt the country was under to trade unions, in times of distress. He was afraid the belief still prevailed that a trade union was an organisation for the promotion of strikes, but the figures now given with regard to the expenditure of the funds should finally dispose of that idea. The exceptional distress of the last year or two was well known, but it was not so well known that even in our best years the expenditure of trade unions on unemployed benefit was exceedingly large, the average figure given by Mr. Brabrook for the twelve years 1892 to 1903 being 347,000*l.* Even in 1900, the last good year of trade, the unemployed expenditure amounted to over 250,000*l.* This benefit was paid by a small group of trade-unions with a total membership of about 600,000, and was representative of the variations in employment of a very large number of men indeed. The Board of Trade returns did not give any idea of the enormous number of men affected by unemployment during the year, and it was extraordinary that notwithstanding this insecurity of tenure we should get these savings, amounting, as shown in the table at the end of the paper, to 396,000,000*l.* That might tend to create a feeling of optimism, till one reflected upon the enormous number of people to whom that money belonged. Taking away the investments of the lower middle and middle classes in building societies, there would not be left more than from 250,000,000*l.* to 300,000,000*l.* as the savings of the working classes proper, and although that might appear a large sum, what was it in proportion to the accumulated wealth of the country? Taking that at 12,000,000,000*l.*, dividing it by the former sum would give the ratio of something like 1 in 40. The oversea investments which had been lately so much discussed in connection with the fiscal

controversy brought in probably 100,000,000*l.* per annum, and amounted probably to 2,250,000,000*l.*, so that they amounted to about six times as much as the savings of the working classes in this country and the class immediately above that. He was not forgetting that an undefined amount in the shape of houses and so on had passed into the possession of past savers, but against that he put the fact that a very large proportion of the funds belonging to various friendly institutions would be expended in keeping their members efficient, and would not pass into the accumulated wealth of the workers themselves. While they were glad to see this very considerable increase since Mr. Brabrook last read his paper, the fact remained that nearly the whole of the country, of whose wealth and prosperity they were never tired of boasting, was exceedingly poor. As a matter of fact we lived in a very poor country, veneered by a thin layer of well-to-do people.

MR. T. A. COGHLAN said, like Mr. Brabrook, he had been a registrar of friendly societies, having held that position, with some slight intermission, from 1892 until the beginning of this year. Up to the time of his appointment in New South Wales, it had not been considered necessary to enforce upon the societies the provisions of the law relating to actuarial sufficiency, and his first step was to notify societies that he would refuse to register any new society whose scale of contributions was not, in his opinion, sufficient for the benefits proposed to be granted, or to register any amended rules which contained any provision likely to impair the sufficiency of the contributions already being paid. The immediate result of this action, which was taken in the teeth of the powerful influence which the friendly societies exercised in New South Wales, was to stop for a time the registration of new societies. In England friendly societies had had the advantage of having connected with them in official or other positions gentlemen well versed in the actuarial science; with them, however, the opposite was the case, and there arose the perpetual difficulty of explaining to societies and their representatives that an increase of funds did not necessarily mean an improvement in their position. Owing to the laxity of the law and of its administration, societies were competing in a very wild manner for new members, and it was not until he had been in office for several years that they were forced to review their position.

Eventually a new Act was passed in 1899, under which the societies were compelled to put themselves in a solvent condition. Unfortunately the influence of the societies was so great that Parliament was induced to alter what was a satisfactory measure, so as to limit its provisions with regard to actuarial solvency to new societies, and to impose sufficient contribution only on members joining existing societies after the date of the passing of the Act. Even these limitations did not satisfy the societies, as Parliament was further induced to postpone the time when new members should pay adequate contributions for a period of two and a half years, during which time some of the societies exerted themselves

to obtain new members on the plea that any person who joined an established society before the period of grace had expired would have the advantage of paying much lower fees than would be the case afterwards. The result was that in nearly all societies in New South Wales there was the anomalous condition of two sets of members, the old members paying inadequate contributions, and the new members, contributions calculated to accord with the benefits to be received. He did not expect that the matter would be remedied until the new members of old societies were sufficiently numerous to outvote the old, when he hoped to see not only equal contributions imposed upon the old members, but a reduction of benefits to compensate for the inadequacy of contribution in past years.

Mr. Brabrook raised a very interesting question in regard to juveniles. So far as he could learn from the paper, the practice of dealing with juvenile members of lodges could not be said to be definitely settled. In New South Wales the present tendency was to keep the juvenile societies distinct from those for adults, but although the juvenile lodges had nominal management, the actual control belonged to the parent body. There were strong arguments in favour of the continuation of this course, as it was found, he believed, that juvenile members were those most disposed to support novel proposals and expensive conditions of management. He thought generally Australian societies endeavoured to pass the members of juvenile lodges automatically into the adult lodges after they had attained a certain age. It was true that there was very little risk attending juvenile members, but the parent societies in a sense compensated the juveniles by admitting them on more favourable terms than ordinary members to their membership. It would be interesting to discover to what extent the adult societies benefited as regarded members from juvenile societies; he had an idea that this benefit was not very great, as people did not become serious members of benefit societies until they had serious responsibilities, either actual or in prospective.

The question of allowing subordinate societies to invest their funds with a district society had now been settled in New South Wales in favour of this practice, although prior to the passing of the new Act one or two societies managed their affairs in this manner. The present tendency amongst societies was for an amalgamation of all the benefit funds, placing them with the district society, grand lodge, or whatever name it might work under. There were some very plausible arguments in favour of this course; there was generally an increase in the rate of interest and diminution of idle money. On the other hand, he could perceive a tendency for laxity of supervision. Where a subordinate society was dealing with its own funds it tended to be much more strict than a society administering funds of an organisation of which it was only a part, and he thought now that the amalgamation of funds had become general in New South Wales, that there would be an apparent increase in the rate of sickness.

The question of allowing trade unions to act as friendly

societies, giving sick and funeral benefits, had recently cropped up in New South Wales. Prior to the Act of 1899 it was doubtful whether trade unions could establish themselves as quasi-friendly societies; but he thought the Act of 1899, when rigidly interpreted, excluded them from this privilege, and in his opinion very rightly so. The business of attending to the supervision of sickness benefits was one that required close watching, as the men who were most fitted to conduct the affairs of a trade union were not those who had the qualifications requisite for the management of a benefit fund. In New South Wales, since 1899 registration had been refused to trade union rules which provided sickness and funeral benefits, unions being required to confine themselves ' e puri specifically mentioned in the Trade Unions Act.

The right to recover subscriptions in arrears had been conceded to the New South Wales societies by the Act of 1899. There were some plausible reasons in favour of the right to sue members for limited amounts of subscription in arrears. The member might be in arrears for a period, but during that time have the privilege of being attended by the doctor, or at all events the doctor might be paid fees on his behalf. The management expenses continued whether he paid his subscription or not, and during the time specified by the rules he had the option of returning to full membership. Thus there was, in a certain sense, a selection exercised by the members against the society. Of course there were arguments on the other side, chief of which, he opined, was that the right to sue for subscriptions really destroyed the friendly principle which underlay these organisations.

The worst feature about the societies of New South Wales was the establishment of the two classes of members to which he had already referred, namely, the old members, who joined before the actuarial provisions of the Act were allowed to come into force, and the new members, who joined subsequent to that date. The evil effects of this system, and of the past operation of insufficient contributions, would be seen from a comparison of the societies of New South Wales with those of the neighbouring State of Victoria, which had been regulated according to actuarial conditions for considerably over twenty years. Making the crude comparison as regards amount of accumulated funds per head, he found that according to the latest returns the amount in Victoria was 13*l.* 6*s.* 7*d.*, and in New South Wales 8*l.* 6*s.* 1*d.*, notwithstanding the fact that the average number of members and length of membership was much the same in each State, and that as regarded value of benefits the New South Wales benefits were on the whole larger than those in the adjoining State.

All the actuarial determinations of the value of benefits given by Australian societies were founded on the experience of English societies. It would make an interesting comparison if the average rate of sickness for each age, and mortality experienced, were worked out. He believed this was likely to be done, and felt sure it would be acceptable to the Royal Statistical Society.

Mr. CURTIS said one of the outstanding facts in the last period of ten years, at any rate in London, was the rapid increase of the slate clubs or dividing societies, some of which were registered. He would like to ask Mr. Brabrook if he were able to give any kind of estimate as to their number and membership and amount of turnover, and also whether he or anybody else could suggest a method by which the working men of the country could be roused to the fact that they could not have their cake and eat it; and that while in health and strength they were eating their cake and not making provision for the bad time that would inevitably come upon them. He differed from the view put forward by Mr. Bailey, that and above what was necessary for sickness should be made for the old age benefit, a provision should also be made for the old age benefit, a provision which was increasing year by year as the members grew older.

Mr. GEORGE MOORES, Manchester, differed from the pessimistic view of the working classes taken by a previous speaker. Instead of being pessimistic, he thought they had every reason to be optimistic as to the condition of the working man to-day. That the increase in the growth of membership was less rapid than formerly was to be accounted for mainly by two things: Trade unions were pressing their members more and more to pay for a sickness benefit, thereby making it almost impossible for a man to pay two friendly society subscriptions; and a number of workmen's compensation societies had been established during the last decade. The funds of these societies were put at 181,432*l.*, but the benefits they conferred were not to be estimated according to the funds in hand at the end of the year, but rather by the amounts paid out week by week, of which the figures in the paper gave no indication. Some of the compensation societies provided for old age and sickness as well as accidents. Regarding them from a national point of view they had probably been a good thing, but from the friendly societies' point of view the stronger they became, and the greater the number of working men they drew in as members, the fewer potential members there were for the friendly societies to take up. With regard to the three quinquennial valuations of the Manchester Unity, that for 1889-91 showed a percentage of assets to liabilities of 96.4, but that percentage had increased, and the last valuation showed 1*l.* in hand for every 1*l.* promised, showing that the Manchester Unity was a perfectly solvent society. This society took the step of having these valuations not only before Parliament compelled it, but before Parliament even thought about it, and the Act of 1875 compelled all friendly societies to follow the practice of the Manchester Unity. As to the subsidising of friendly societies by a guarantee of interest, he believed that would be the very worst thing that could happen to them. Friendly societies in some parts of the country were satisfied with the Post Office rate of interest, 2½ per cent., while in the next village the accumulated funds of the local lodge would perhaps be invested

at $3\frac{1}{2}$ per cent., the difference between $2\frac{1}{2}$ per cent. and $3\frac{1}{2}$ per cent. representing the greater amount of intelligence, activity and foresight displayed on the part of the members of the better lodge, and if the State should step in and guarantee, say 3 per cent. interest, it would be a direct incentive to the members of the "happy-go-lucky" lodges to remain as lazy as before, while getting an additional $\frac{1}{2}$ per cent. It would certainly be no incentive to members of other lodges to see how they could increase their society's resources, to be continually on the look out for better opportunities of investment, and more vigilant in the administration of sick benefit. With a Government guarantee all that feeling of independence, which he regarded as one of the excellent features of English friendly societies as compared with the Continental system, would be swept away. On the Continent a paternal Government was always wanting the working man to accept something. In this country the working man only asked to be let alone, and had sufficient independence and ability to do the thing himself.

Mr. H. V. TOYNBEE (Charity Organisation Society) asked whether in a return of accumulated funds amounting to nearly 400,000,000*l.*, it might not be possible for amounts to be reckoned twice over. Friendly societies, as had been mentioned, deposited a fair amount with the Post Office and Trustees' Savings' Banks; and was the amount held by the Post Office also included in the amount held by the friendly societies? The same observation would apply to trade unions, and possibly to other organisations, so that this sum of 396,000,000*l.* might represent a smaller amount of savings than it appeared to do. With reference to sharing-out societies, he believed it was a fact that the Manchester Unity was trying very hard to have a short Act of Parliament passed making it compulsory that all societies, including the sharing-out societies, should be valued, with the object, he supposed, of making it impossible for these societies to exist, because there would be nothing to be valued. He would ask Mr. Brabrook if he thought it advisable that such a Bill should become law?

Mr. N. A. GODDARD agreed with Mr. Coghlan as to the separation of the trade union sick and funeral benefit from trade relief benefits, and, as an abstract proposition, he would be very pleased indeed to see the Friendly Societies Act amended so as to enable the Registrar to refuse registration to a trade union which also provided sick and funeral benefits. The amalgamation of the two things was not now necessary, even if it were many years ago, when trade unions were not so well understood, when friendly societies were not so well known, and there was greater difficulty in getting working men into the friendly societies. As to the decline in the increase of membership, he was afraid all the causes of that had not been referred to, and doubted if it were possible to get at them all. But one thing with regard to the larger societies might be taken into account: those societies had been so prosperous,

and had so greatly increased in numbers and finances, that they had not taken the trouble to let themselves be known to the world as they ought to have done, but had preferred to "rest and be thankful," with the result that the slate clubs and dividing societies had encroached considerably upon the friendly societies proper. They called themselves friendly societies because they had a right to be registered, but were not friendly societies as the term was generally understood; they had flaunted themselves in the face of the working man, and the working man had been deceived into believing that they could carry out the same benefits that the old-established friendly societies could. As to provision for old age, the friendly societies had done but little, for the reason that it was impossible for the working man to pay the rate of contribution that would be required to pay old age pensions; the only solution of the problem was a national pension scheme; voluntary societies could not do it. The Manchester Unity had grappled with the question, and had prepared tables for superannuation benefit, but the scheme had been practically ignored by the membership. One district which had taken it in hand had endeavoured to show that its attempt had been successful, but the whole thing had been riddled, and if the membership went on decreasing as it had done, in consequence of the increased contributions demanded, the district would gradually become extinguished, or at any rate would not have the same class of membership as formerly. As to the registration of societies on the basis that their assets should meet their liabilities, as mentioned by Mr. Loch and Mr. Coghlan, he thought it a very desirable object, but though the Manchester Unity had prepared a short Bill, he did not think that the right way to effect it. The Bill was not a good Bill, and he hoped, in the interests of friendly societies, it would not be passed, but that some other means would be proposed for dealing with the question, and thus enable the public to understand the difference between good and bad thrift.

Mr. BRABROOK, in reply, said the paper read by Mr. Coghlan was an exceedingly valuable addition to their knowledge of the subject. The discussion had not been of a controversial character, and did not call for much reply, nor did he think it desirable that he should enter upon a discussion of propositions for the amendment of the law. The question of Mr. Toynbee as to the possible duplication of figures was a very important one. It was unavoidable in statistics of this kind that there should be that duplication. Besides investments of societies in savings banks, there were investments by co-operative societies in other co-operative societies, which necessarily appeared twice over. The only thing that could be said was that the error caused by including investments twice over was very much less than the amount of unregistered and unknown savings in various other cognate societies. With regard to the supposed greater popularity of dividing societies, he did not think that had shown any increase; they had always been more popular than the ordinary accumulating permanent society. In the

list of friendly societies, say of Liverpool, there would be found ten or more dividing societies to one permanent. To some persons a temporary insurance answered every purpose : for instance, those who did not know whether they would be in the same place more than a year. He did not believe that anyone was induced to enter a dividing society by force or fraud, or that there was anything immoral in the constitution of a dividing society. Only members about the same age would join it, because no sensible young men would join a dividing society consisting largely of old men ; and the members knew they would have only their own savings to look to, and that a time must come when no dividing society would be of any more use to them, but that was not a state of things that anything could be done to stop so long as people liked to have their annual surplus in their own pockets. No form of statute could be devised to prevent it. The business of the legislature was not to tell people what contracts they ought to make, but only to see that people honestly carried out those they did make.

The following were elected Fellows of the Society :—

Keshishian, Agazar.

|

Keyworth, William.

REPORT OF THE COUNCIL

For the FINANCIAL YEAR ended 31st December, 1904, and for the SESSIONAL YEAR ending 27th June, 1905, presented at the SEVENTY-FIRST ANNUAL GENERAL MEETING of the ROYAL STATISTICAL SOCIETY, held at the Society's Rooms, 9, Adelphi Terrace, Strand, W.C., London, on the 27th of June, 1905.

THE Council have the honour to submit their Seventy-first Annual Report.

The roll of Fellows on the 31st December last as compared with the average of the previous ten years was as follows :—

Particulars.	1904.	Average of the previous Ten Years.
Number of Fellows on 31st December	925	916
Life Members included in the above	175	179
Number lost by death, withdrawal, or default	58	52
New Fellows elected	44	49

Since the 1st January last, 22 new Fellows have been elected, the resignation of 1 Fellow has been cancelled, and 1 Fellow has been transferred from the List of Honorary Fellows to the List of

Ordinary Fellows, and the Society has lost 31 by death, resignation, or default, so that the number on the list on 27th June, 1905, was 918.

The Society has to deplore the deaths of the undermentioned Fellows since June last year :—

Deaths of Fellows since June, 1904.

	Date of Election.
*Carpenter, Henry Saunders	1893
Clay, Walter Gorst, M.A.	1899
Collet, Sir Mark Wilks, Bart.	1887
<i>d</i> Digby, William, C.I.E.	1902
Goulding, William Purdham, F.S.I.	1885
<i>d</i> Guthrie, Edwin	1885
*Harcourt, The Right Hon. Sir William Vernon, } K.C., M.P., F.R.S.	1871
<i>c d</i> Harvey, Alfred Spalding, B.A.	1881
M'Clean, Frank	1867
*Mocatta, Frederick D., F.R.G.S.	1874
Morris, John.....	1888
<i>d</i> Norman, Field-Marshal Sir Henry Wylie, G.C.B., } G.C.M.G.	1877
Northbrook, The Right Hon. the Earl of, G.C.S.I., } D.C.L.	1878
Parry, Thomas	1878
<i>c</i> Samuelson, The Right Hon. Sir Bernhard, Bart., F.R.S.	1868
Silver, Stephen William	1886
White, Leedham	1863

Deaths of Honorary Fellows since June, 1904.

<i>d</i> Boccardo, Gerolamo	1879
<i>d</i> Juglar, Clément ...	1870

c Indicates those who had served on the Council.

d Indicates those who had been Donors to the Library.

* Indicates Life Members.

During the same period the following new Fellows have been elected :—

à Ababrelton, Robert.	Lutterveld, Willem Margriet Johan van.
Adams, W. G. S., M.A.	Mudie-Smith, Richard.
Arkovy, Richard.	Muller, Osvald Valdemar, M.A.
Azevedo, Joao Lucio d'.	Nevill, Henry Rivers.
Banaji, Khoshru Nowrosji.	Pocock, Bernard George, A.S.A.A.
Carrington, John Broyden.	Rogers, Arthur George Liddon, M.A.
Charles, Thomas Edwin.	Rosenbaum, Simon.
Cohen, Charles Waley.	Schlesinger, Louis G.
Daugherty, Charles M.	Seyd, Richard, E.N.J.
Dyke, Arthur James.	Silversides, Charles William.
Dymant, Arthur Francis.	Sim, James Duncan Stuart.
Fellowes, The Right Hon. Ailwyn, M.P.	Smith, Hastings B. Lees, M.A.
Haig, C. R.	Smith, Stanley George.
Hill, William Edward.	Souter, John.
Hobson, John Atkinson.	Sowrey, John William.
Hodge, James Philp, A.C.A.	Stoppelaar, Gerard Nicolaas de.
Holt, Thomas.	Taylor, William B., B.A., LL.B.
Hooper, Frederick Turngate.	Wadia, N. P. N.
Jones, John Henry.	Wallis, Bertie Cotterell, B.Sc.
Keshishian, Agazar.	Walsh, Correa Moylan.
Keyworth, William.	Watkins, John M.
Leonhardt, F. von.	White, Richard, F.C.I.S.
	Williams, Frederick Alfred.

The financial condition of the Society is shown in the Auditors' report, *vide* Appendices A(i), A(ii). The current year began with a balance of 649*l.* 19*s.* 10*d.*, the receipts were 1,936*l.* 4*s.* 2*d.*, and the expenditure 1,930*l.* 19*s.* 9*d.*, leaving a balance of 655*l.* 4*s.* 3*d.*, an increase of 5*l.* 4*s.* 5*d.* over that of 1903. The expenditure, it should be noted, includes a purchase of 100*l.* consols, which cost 88*l.* 5*s.* Details for the last twenty-five years are given in Appendix B. The cordial thanks of the Council have been tendered to the Auditors for their honorary services in auditing the Treasurer's accounts for the past year.

The munificent bequest to the Society by the late Dr. Guy (President in 1873-75) became payable on the death of his widow, which occurred on 5th April last. The funds of the Society have been thus augmented by a sum which, after payment of legacy duty, amounts to about 10,000*l.* Consols, and represents, therefore, at the present time not much over 9,000*l.* in cash value, and will be included in next year's Balance Sheet at the then value of the Consols.

The contributions to the Society's transactions presented at the Ordinary Meetings of the Session, 1904-05, have been as follows :—

1904.		
First	15th November	POWELL, Sir Francis Sharp, Bart., M.P. The President's Inaugural Address.
Second	20th December	PRICE, L. L. The Accounts of the Colleges of Oxford, 1893-1903, with Special Reference to their Agricultural Revenues.
1905.		
Third	17th January.....	DUDFIELD, Dr. R. A Critical Examination of the Methods of Recording and Publishing Statistical Data bearing on Public Health, with Suggestions for Improving such Methods.
Fourth	21st February	PALGRAVE, R. H. Inglis, F.R.S. Agricultural Losses in Great Britain and Ireland during the last Thirty Years.
Fifth	21st March.....	SHAW, Dr. W. N., F.R.S. The Seasons in the British Isles since 1878.
Sixth	18th April	BRABROOK, E. W., C.B. Progress of Friendly Societies and other Institutions connected with the Friendly Societies Registry Office during 1894-1904.
Seventh	16th May	WARD, Leonard. Howard Medal Prize Essay.
Eighth	27th June	ROSENBAUM, Simon. Vital and other Statistics of the Jews in the United Kingdom.

Appendix C is intended to show, as far as is practicable, the growth of the Society's Library during the past two years, and also the extent to which it is used by Fellows of the Society and others. It is estimated that, exclusive of periodicals, about 1,100 publications of varying sizes are received yearly by the Society, most of them being official returns. The periodicals number about 170, and include weekly, monthly, and quarterly returns dealing with trade, labour, vital and other statistics, as well as proceedings or journals of societies and institutions, and newspapers.

The monthly average number of books lent during 1904 was 63, in 1903 it was 73; the average number of borrowers per month was in the first-named year 37, in 1903 42. Adding the number of those who visit the Library to consult books and for other purposes, the total was 1,069 in 1904 and 1,113 in 1903, or an average of 89 persons per month in 1904, and 93 persons per month in 1903.

The Council have decided to proceed at once to the preparation of a new Catalogue of the Library, which shall incorporate and replace that which was issued to the Fellows in 1884. On the recommendation of the Library Committee, the Society's staff has been temporarily augmented by securing trained assistance in the work of cataloguing, and considerable progress has already been made. It is proposed in the first instance to issue a catalogue of the whole Library arranged so far as possible under the authors'

names. Occasion will also be taken to prepare a complete Index, to be published separately, of the Society's *Journal*.

The Council have carefully considered various suggestions which have been made relating to the *Journal*, and have decided to leave the editorial responsibility in the hands of the Honorary Secretaries, with the aid of the Assistant Secretary.

The record of attendance at the ordinary meetings of the Society shows an average of 54 for the current year, and the Council desire to express their thanks to those gentlemen whose valuable papers have so largely contributed to the maintenance of public interest in the Society's work.

Under the conditions in the regulations laid down for the award of the Guy Medal, the Council awarded a Guy Medal in silver to Mr. R. Henry Rew for his work in connection with the preparation of the Reports of the Special Committee appointed by the Society to investigate the Production and Consumption of Meat and Milk in the United Kingdom, and for his paper entitled "Observations "on Production of Meat and Dairy Products."

The subject of the Howard Medal Essay for 1903-04 was "The Effect as shown by Statistics of British Statutory Regulations directed to the Improvement of the Hygienic Conditions "of Industrial Occupations," and the medal was awarded to Mr. Leonard Ward.

The Council regret to report the resignation by Mr. Noel A. Humphreys of the position of Honorary Secretary, which he has held since June, 1896. The thanks of the Society are due to him for the services he has rendered, and the Council are glad to know that they will still retain the advantage of his co-operation as a member of their body.

The tenth Session of the International Statistical Institute will be held in London at the Imperial Institute, South Kensington, from 31st July to 5th August next, and the Council have the pleasure to report that the Honorary President of the Society, H.R.H. the Prince of Wales, has consented to act as Honorary President of the Congress, and to preside at the opening meeting on Monday, 31st July, at 11 A.M. The Committee for organising the arrangements for receiving the Institute, which was referred to in the last annual report, has been considerably enlarged, and has established a guarantee fund for meeting the necessary expenses. To this fund the Society has subscribed 100*l.*, and a number of contributions have been made by Fellows of the Society and others interested in the progress of statistical science.

The following Fellows (nominated in accordance with By-law 14) are recommended for election as President, Council, and Officers of the Society for the Session 1905-06 :—

PROPOSED COUNCIL AND OFFICERS FOR 1905-06.

PRESIDENT.

THE RIGHT HON. THE EARL OF ONSLOW, G.C.M.G.

COUNCIL

*William Mitchell Acworth, M.A.	*The Rt. Hon. Lord George Francis
Arthur Hutcheson Bailey, F.I.A.	Hamilton, M.P., G.C.S.I.
J. A. Baines, C.S.I.	Frederick Hendriks, F.I.A.
Henry Birchenough, M.A.	Noel A. Humphreys, I.S.O.
Sir James Blyth, Bart.	Arthur William Waterlow King.
*Arthur Lyon Bowley, M.A.	*Bernard Mallet.
*Edward W. Brabrook, C.B., F.S.A.	Richard Biddulph Martin, M.A., M.P.
Sir Ernest Clarke.	Francis G. P. Neison, F.I.A.
*Timothy Augustine Coghlan.	L. L. Price, M.A.
Nathaniel L. Cohen.	Lesley Charles Probyn.
Richard F. Crawford.	R. Henry Rew.
Rev. W. Cunningham, M.A., D.D.	William N. Shaw, M.A., F.R.S., D.Sc.
Geoffrey Drage, M.A.	H. Llewellyn Smith, C.B., M.A., B.Sc.
Arthur Wilson Fox, C.B.	David A. Thomas, M.A., M.P.
Sir John Glover.	Thomas Abercrombie Welton, F.C.A.

Arthur Whitelegge, C.B., M.D.

Those marked * are new Members of Council.

TREASURER.

Richard Biddulph Martin, M.A., M.P.

HONORARY SECRETARIES.

J. A. Baines, C.S.I. | R. Henry Rew.
Arthur Wilson Fox, C.B.

HONORARY FOREIGN SECRETARY.

J. A. Baines, C.S.I.

The abstract of receipts and payments, and the estimate of assets and liabilities on 31st December, 1904, together with the report of the Auditors on the accounts for the year 1904, are appended.

Signed on behalf of the Council,

FRANCIS SHARP POWELL,
President.

J. A. BAINES,
N. A. HUMPHREYS, } *Hon. Secretaries.*
R. H. REW,

J. A. CABLE,
Assistant Secretary.

APPENDICES TO ANNUAL REPORT.

A (i).—ABSTRACT of RECEIPTS and PAYMENTS for the YEAR ending
31st DECEMBER, 1904.

RECEIPTS.		£ s. d.		PAYMENTS.		£ s. d.	
Balance on Deposit ...	£300 - -			Rent, less Tax	£357 16 3		
„ in Bank, 31st } December, 1903 ... }	310 5 8			Less sublet	50 - -		
Balance of Petty Cash	36 4 8					307 16 3	
„ Postage } Account }	3 9 6			Rates and Taxes		42 18 -	
		649 19 10		Fire, Lights, and Water		44 1 7	
Dividends on 3,000L } Consols and 400L } G.N.R. Stock	85 9 4			Furniture and Repairs		29 13 -	
Interest on Deposit.....	8 18 8			Salaries, Wages, and Pension ...		587 12 6	
		94 8 -		Journal, Printing.....	£453 15 5		
Annual Subscriptions:—				„ Shorthand } Reporting }	34 11 -		
34 Arrears	71 8 -			„ Literary } Services }	32 14 5		
631 for 1904	1,325 2 -					521 - 10	
5 in Advance	10 10 -			Ordinary Meeting Expenses		16 16 9	
670		1,407 - -		Advertising		12 15 3	
				Postage and delivery of Journals..		74 9 6	
Compositions	123 18 -			Stationery and Sundry Printing...		45 17 1	
Journal Sales	253 4 11			Library.....		92 - 1	
Advertisements in Journal	57 13 3			Incidental Expenses		45 6 5	
				Guy Medal		1 10 -	
Total	£2,586 4 -			Howard Medal		20 17 6	
						1,842 14 9	
				Purchase of 100L Consols		88 5 -	
						1,930 19 9	
				Balance on Deposit ...	£500 - -		
				Balance per Bank } Book	121 9 10		
				Balance of Petty Cash	28 6 1		
				„ Postage } Account..... }	5 8 4		
						655 4 3	
				Total	£2,586 4 -		

(Signed)

“ 6th February, 1905.

“ CHAS. ATKINSON,
“ A. H. BAILEY,
“ S. CHAPMAN, } *Auditors.*”

A (ii).—ESTIMATE of ASSETS and LIABILITIES on 31st DECEMBER, 1904.

LIABILITIES.			ASSETS.		
	£	s. d.		£	s. d.
Harrison and Sons, for December } Journal	113	2 11	Balance on Deposit ... £500 - -		
Miscellaneous, as per list	165	13 2	Cash Balances	155	4 3
5 Subscriptions received in ad- } vance	10	10 -			
	289	6 1	3,000 <i>l.</i> New 2½ per cent. Consols } cost }	2,848	19 5
Balance in favour of the Society ...	3,812	4 10	400 <i>l.</i> G.N.R. Preferred Con- } verted Ordinary Stock...cost }	484	11 6
(Exclusive of (1) the Rever- sionary Interest bequeathed to the Society by the late Dr. Guy; (2) Books in Library; (3) Journals, &c., in Stock; and (4) Pictures, Furniture, and Fixtures.)			Arrears of Subscriptions reco- } verable say }	52	10 -
			Sundry debtors	60	5 9
	£4,101	10 11		£4,101	10 11

(Signed)

" CHAS. ATKINSON,

" A. H. BAILEY,

" S. CHAPMAN,

} *Auditors.*

" 6th February, 1905.

A (iii).—BUILDING FUND (ESTABLISHED 10th July, 1873), BALANCE SHEET,
on 31st DECEMBER, 1904.

This Fund is invested in Metropolitan Consolidated Three and a Half per Cent. Stock. On the 31st December, 1903, the Fund was invested in 324*l.* -s. 10*d.* Stock, with the dividends received during 1904, additional Stock to the amount of 10*l.* 9*s.* 1*d.* was purchased by the Bank of England for the Society. Accordingly, on the 31st December, 1904, the total investment amounted to 334*l.* 9*s.* 11*d.* Stock.

A (iv).—"REPORT OF THE AUDITORS FOR 1904.

"The Auditors appointed to examine the Treasurer's Accounts of the Society for the Year 1904,

"REPORT:—

"That they have compared the Entries in the Books with the several Vouchers for the same, from the 1st January to 31st December, 1904, and find them correct, showing the Receipts (including a Balance of 649l. 19s. 10d. from 1903) to have been 2,586l. 4s. -d., and the Payments 1,930l. 19s. 9d., leaving a Balance in favour of the Society of 655l. 4s. 3d. at the 31st December, 1904.

"They have also had laid before them an Estimate of the Assets and Liabilities of the Society at the same date, the former amounting to 4,101l. 10s. 11d., and the latter to 289l. 6s. 1d., leaving a Balance in favour of the Society of 3,812l. 4s. 10d., exclusive of (1) The Reversionary Interest bequeathed to the Society by the late Dr. Guy; (2) Books in the Library; (3) Journals, &c., in Stock; and (4) Pictures, Furniture, and Pictures.

"The Building Fund at the end of the year 1903 was invested in 324l. -s. 10d. Metropolitan Consolidated Three and a Half per Cent. Stock, and, with the Dividends received during 1904, additional Stock to the amount of 10l. 9s. 1d. was purchased by the Bank of England for the Society. Accordingly, on the 31st December, 1904, the total investment amounted to 334l. 9s. 11d. Stock.

"They have verified the Investments of the Society's General Funds and the Building Fund, and also the Banker's Balance, all of which were found correct.

"They further find that at the end of the year 1903 the number of Fellows on the list was 939, which number was diminished in the course of the year to the extent of 58, by Death, Resignation, or Default, and that 44 new Fellows were elected or restored to the list, leaving on the list on the 31st December, 1904, 925 Fellows of the Society.

(Signed)

" CHAS. ATKINSON,	} Auditors."
" A. H. BAILEY,	
" S. CHAPMAN,	

" 6th February, 1905.

B.—Statement of the Condition of the Society in the last Twenty-five Years 1880-1904.

Year.	Number of Fellows on 31st December.	Number of Com-pounders included therein.	Losses during Year by Deaths, &c.	Gains by Election, &c., during Year.	Income from					Expenditure.		Amount Invested on 31st December.	Year.	
					Annual Subscrip-tions.	Composi-tions.	Journal Sales.	Investments and other Sources.	All Sources.	Total.	Of which			
											On Journal.			On Library.
	£	£	£	£	£	£	£	£	£	£	£	£		
1880....	808	129	49	74	1,317	273	202	110	1,902	1,806 ^a	573	80	1880	
'81....	807	130	45	44	1,306	84	145	114	1,649	1,697 ^a	609	37	'81	
'82....	786	135	63	42	1,291	189	227	131	1,838	1,782 ^a	553	60	'82	
'83....	860	139	41	115	1,361	126	150	141	1,778	1,943 ^a	585	49	'83	
'84....	909	150	57	106	1,417	294	207	1,198	3,146 ^b	3,088 ^c	645	38	'84	
'85....	928	148	55	74	1,462	63	188	349	2,062 ^d	2,070 ^e	625	27	'85	
'86....	943	156	70	85	1,583	231	180	92	2,086	2,106 ^e	735	32	'86	
'87....	977	160	59	93	1,621	126	188	94	2,029	2,135 ^f	609	87	'87	
'88....	1,059	172	58	140	1,686	334	171	101	2,292	2,003	711	58	'88	
'89....	1,060	175	69	70	1,678	126	229	82	2,115	2,060 ^g	623	46	'89	
1890....	1,063	177	65	68	1,764	84	155	94	2,097	2,096 ^a	567	68	1890	
'91....	1,019	172	80	36	1,707	42	146	181	2,076 ^h	1,957 ⁱ	582	172	'91	
'92....	994	171	70	45	1,634	84	158	104	1,980	1,883 ^j	539	94	'92	
'93....	964	176	66	36	1,560	124	128	92	1,904	1,921 ^k	578	63	'93	
'94....	933	180	67	36	1,491	105	152	82	1,830	1,904	649	75	'94	
'95....	928	180	59	54	1,468	63	180	82	1,793	1,823 ^k	576	56	'95	
'96....	910	181	48	30	1,478	42	168	84	1,772	1,787	571	44	'96	
'97....	892	182	58	40	1,472	145	157	83	1,857	1,986 ^l	650	50	'97	
'98....	878	180	57	43	1,451	115	182	105	1,853	1,825	609	55	'98	
'99....	896	181	44	62	1,432	95	167	127	1,821	1,805	564	33	'99	
1900....	923	179	36	63	1,514	21	189	148	1,872	1,817	521	53	1900	
'01....	926	177	49	52	1,464	63	211	129	1,867	1,823	518	42	'01	
'02....	932	177	52	58	1,504	21	255	152	1,932	1,839	543	73	'02	
'03....	939	174	49	56	1,517	84	293	151	2,045	1,875	593	91	'03	
'04....	925	175	58	44	1,407	124	253	152	1,936	1,931 ^a	521	92	'04	

^a Includes purchase of Government stock.^b Includes sale of 1,000l. stock.^c Includes expense of moving to new premises.^d Includes Dr. Guy's legacy of 250l.^e Includes cost of Jubilee Volume.^f Includes cost of Catalogue and Index, and of Charter.^g Includes Mrs. Lovegrove's legacy of 100l.^h Includes outlay for drainage repairs.ⁱ Includes cost of doing up interior of premises.^j Includes cost of doing up interior of premises.^k Includes cost of doing up interior of premises.^l Includes cost of doing up interior of premises.^m Includes cost of doing up interior of premises.ⁿ Includes cost of doing up interior of premises.^o Includes cost of doing up interior of premises.^p Includes cost of doing up interior of premises.^q Includes cost of doing up interior of premises.^r Includes cost of doing up interior of premises.^s Includes cost of doing up interior of premises.^t Includes cost of doing up interior of premises.^u Includes cost of doing up interior of premises.^v Includes cost of 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C.—Numbers of Books Added to the Library and Lent, and Numbers of Borrowers from the Library in 1903, 1904, and part of 1905.

Months.	Books, &c., Received.*			Books Lent.						Borrowers.			Visitors using the Library.			Months.
	1903.	1904.	1905.	1903.		1904.		1905.		1903.	1904.	1905.	1903.	1904.	1905.	
				Books.	Vols., &c.	Books.	Vols., &c.	Books.	Vols., &c.							
January	377	353	396	73	89	73	94	55	67	45	48	37	86	98	76	January
February				86	103	77	95	81	120	47	40	44	85	74	80	February
March				75	91	78	89	53	74	45	44	34	94	96	70	March
April				47	59	56	69	74	95	27	30	32	58	73	56	April
May	326	441	—	64	84	46	65	—	—	36	28	—	56	89	72	May
June				115	140	58	74	—	—	54	32	—	108	104	—	June
July				86	124	46	58	—	—	57	30	—	166	74	—	July
August	345	352	—	73	93	62	77	—	—	43	36	—	96	77	—	August
September				53	60	56	65	—	—	30	41	—	76	112	—	September
October				70	96	48	61	—	—	42	29	—	92	89	—	October
November	353	297	—	45	60	76	103	—	—	35	48	—	108	90	—	November
December				94	107	67	103	—	—	44	39	—	88	93	—	December
Year	1,401	1,443	—	881	1,106	753	953	—	—	505	445	—	1,113	1,069	—	Year
Monthly average	116	120	—	73	92	63	79	—	—	42	37	—	93	89	—	Monthly average

* These are the numbers of entries in the quarterly *Journal* under "Additions to Library," and do not represent the number of volumes, &c., of a book; they are also *exclusive* of about 170 periodicals received yearly.

PROCEEDINGS of the SEVENTY-FIRST ANNUAL GENERAL MEETING.

Major CRAIGIE, C.B., Vice-President, in the Chair.

THE HONORARY SECRETARY read the notice convening the Meeting, and the Minutes of the last Ordinary Meeting were read and confirmed.

The CHAIRMAN announced that under Rule 3 of the rules for the award of the Guy Medal, the Council had awarded a Guy medal in silver to Mr. R. Henry Rew, for his work in connection with the preparation of the reports of the Committee specially appointed by the Society to inquire into the Production and Consumption of Meat and Milk in the United Kingdom, and for his paper entitled "Observations on the Consumption of Meat and Dairy Products."

Mr. J. A. BAINES, C.S.I. (Hon. Secretary), then read a summary of the Report of the Council.

The CHAIRMAN moved, "that the Report of the Council, the abstract of receipts and payments, the estimate of liabilities, and the report of the Auditors be adopted, entered on the Minutes, and printed in the Society's *Journal*." He said that, in the absence of the President, Sir Francis Sharp Powell, who was temporarily detained in the House of Commons, it devolved upon him, as the previous President, to move the adoption of the Report. With regard to the epoch-making announcement in the Society's history, that it had now received, by the favour of their late friend and President, Dr. Guy, the legacy to which they had been for some time looking forward, it was hoped that would be the means of placing the Society in several respects on a sounder financial footing. The new Council would have seriously to consider what was to be done with the capital sum; and no doubt they would review not only the suggestions which had been made from within the Council, but also consider very attentively the question left over from the previous session, as to what arrangements should be made for the housing of the Society, a matter that was becoming urgent. The report also contained the announcement, no doubt familiar to them all, that they were to act as hosts of the International Statistical Institute at their meeting at the end of July and the beginning of August. He had to express the thanks of himself and of his colleagues on the Council for the response that had already been made to the appeal which they felt it their duty to address to the fellows generally for the necessary funds to properly receive their foreign guests, and to defray the expenses of printing and administration incidental to a gathering of that nature. He hoped the arrangements now maturing would meet with the satisfaction of the Fellows, and that they might have a large response to the appeal for the welcome of their foreign guests. In most countries the cost of such meetings and the

expenses of hospitality had generally been defrayed by the Government, but in this country that was not the practice, and it therefore devolved upon the Society to step into the gap. As Chairman of the Executive of the Organising Committee, he was glad to be able to say that the response hitherto had been very favourable. Members from at least sixteen or eighteen States had already signified participation in the coming meeting. Their Honorary President, the Prince of Wales, had kindly undertaken to preside and give the address of welcome. The occasion therefore would be an important one. Notices of what was going to take place would be sent out, but plans were not sufficiently completed to be mentioned in the report now before them. In moving the adoption of the report, he would express the hope that they would take every opportunity of making the Society's work known throughout the country generally. The gathering of the International Institute ought to be not only an occasion for the exchange of statistical information, but a very good advertisement for the Society itself, and the Council hoped to extend their numbers in this way.

The HONORARY SECRETARY having read out the list of defaulters, the CHAIRMAN formally declared that they had ceased to be Fellows of the Society.

The Ballot having been taken, the SCRUTINEERS reported that the proposed President, Council, and Honorary Officers for the ensuing Session had been unanimously elected.

The CHAIRMAN moved a cordial vote of thanks to the Scrutineers, which was unanimously carried.

Dr. GINSBURG proposed a vote of thanks to the President, Council, and Honorary Officers for their services during the past year.

Mr. WILLANS seconded the motion, which was unanimously carried.

At this point the President, Sir Francis Sharp Powell, Bart., M.P., arrived and took the Chair.

The PRESIDENT, in acknowledgment, said he could certainly say of himself and the Council that their attention to their duties had been of an exemplary character. He had found on every occasion the deepest interest taken in the proceedings, and the attendance at the Committees had been of a most gratifying character. Speaking for himself, he wished to place upon record his gratification that acknowledgment should have been made of such services as he had been able to render. His twelve months of office had been to him a period, he hoped, of some profit and certainly of great pleasure. It had given him the opportunity of seeing the inner workings of one of their most important Institutions, and of forming many friendships, which he hoped would continue so long as life should last.

MISCELLANEA.

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*I.—International Statistical Institute, London Session,
31st July to 4th August, 1905.*

THE arrangements for the forthcoming meeting in London of the International Statistical Institute are now practically complete.

The Committee responsible for the reception of the Institute consists of the following :—

GENERAL COMMITTEE FOR THE RECEPTION OF THE
INTERNATIONAL STATISTICAL INSTITUTE, 1905.

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H.R.H. THE PRINCE OF WALES, K.G.

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CRAIGIE, Major PATRICK GEORGE, C.B.	

President.

THE RIGHT HON. THE EARL OF ONSLOW, G.C.M.G.

Other Members of the Committee.

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THE PRESIDENT OF THE STATISTICAL AND SOCIAL INQUIRY SOCIETY
OF IRELAND.

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| CRAWFORD, RICHARD F. | MOON, EDWARD R. P., M.P. |
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The details of the arrangements are mainly carried out under the control of the Executive above named, who have been in frequent communication with the foreign members of the Bureau.

The response to the appeal for contributions to the Reception Fund has been satisfactory, the total now guaranteed exceeding 900*l*. The list, up to the time at which this *Journal* is sent to press, is as follows:—

STATISTICAL CONGRESS GUARANTEE FUND, 1905.

List of Subscribers.

	£	s.	d.
The Royal Statistical Society	100	-	-
The Drapers' Company	50	-	-
The Clothworkers' Company	25	-	-
Avebury, The Rt. Hon. Lord, F.R.S.	20	-	-
Debenham, Frank	20	-	-
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Powell, Sir Francis S., Bart., M.P.	20	-	-
Strathcona and Mount Royal, The Rt. Hon. } Lord, G.C.M.G. }	20	-	-
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Booth, The Rt. Hon. Charles, F.R.S.	10	-	-
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Schloss, David F., M.A.	2	2	-
Seyd, Ernest	2	2	-
Seyd, Richard	2	2	-
Somerville, William, D.Sc., M.A.	2	2	-
Yule, G. Udny	2	2	-
King, A. W. W.	2	-	-
Moon, E. R. P., M.P.	2	-	-
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The fund still remains open to afford any Fellows of the Society who may still wish to subscribe an opportunity of doing so.

The meetings of the Institute will be held in the Imperial Institute, South Kensington.

The gathering will include the official delegates appointed by various Governments, the ordinary members of the Institute, and such distinguished persons as have received special invitations to the Congress.

Up to the present, representatives of sixteen separate States outside of the British Empire have signified their intention of attending.

H.R.H. the Prince of Wales, who is Honorary President of the Royal Statistical Society, has accepted the office of Honorary President of the Congress, and will attend the opening meeting on Monday, 31st July, at 11 A.M., and deliver an inaugural address. This will be followed by an address by the President of the Institute, Dr. von Inama-Sternegg, and the President of the Royal Statistical Society, the Earl of Onslow, will also take part in the proceedings. The business of the general assembly will comprise the reception of a Report from the General Secretary, Signor Bodio, and the election of new members of the Institute.

Among the communications to be presented for discussion at the meeting of the Institute are the following:—

Superficie et population du Monde.

Rapporteur : Prof. Emile Levasseur.

Balance Économique des nations.

Rapporteur : Dr. Ignaz Gruber.

Mortalité des grandes Villes.

Rapporteur : Joseph de Körösy.

Statistique de la tuberculose :

Rapporteur : Prof. Lexis.

Fécondité des mariages.

Rapporteur : A. N. Kiaer.

Statistique des Transports Internationaux.

Rapporteur : General A. de Wendrich.

Accidents du Travail.

Rapporteur : Dr. Kögler.

International Comparison of Workmen's Wages.

A. Wilson Fox.

Recensements industriels et statistique du Chômage.

M. Lucien March.

L'Enseignement Supérieur.

Rapporteur : Prof. Carlo F. Ferraris.

Import and Export Statistics.

Sir A. E. Bateman.

RépercuSSION des droits de douanes.

Rapporteur : Yves Guyot.

International Agricultural Statistics.

Major P. G. Craigie.

Valeurs mobilières.

Rapporteur : Alfred Neymarck.

Some Subjects connected with Pauperism.

Dr. C. S. Loch.

Discours sur l'Avenir de la Statistique.

Prof. Jules Mandello.

The agenda is not yet complete, as several other important papers are expected, and the business of the Session will only be finally arranged at a meeting of the Bureau of the Institute, to be held in London on 29th July. A daily order of business will be printed during the Session, together with summarised reports of the discussions on the papers read.

The Reception Committee have the gratification to announce that the Lord Mayor has kindly offered to extend to the Institute the generous hospitality for which the Mansion House is famous, and will give a dinner to the delegates on the evening of Monday, 31st July. On Wednesday, 2nd August, the Reception Committee, on behalf of the Royal Statistical Society, will entertain the Institute at dinner at the Whitehall Rooms; and on Friday, 4th August, it is

intended to arrange a *Conversazione* at the Royal Botanic Gardens, Regent's Park. Tickets for the Society's dinner (price 21s., including wine) may be obtained by Fellows of the Society from the Assistant Secretary.

II.—*The Statistics of Wages in the United Kingdom during the Last Hundred Years.* (Part XI.) *Engineering and Shipbuilding.*
B. *Statements of Wages from Non-Trade Union Sources in General Engineering.* By A. L. BOWLEY, M.A., and GEORGE H. WOOD.

WHEN the first article of the series dealing with wages in engineering and shipbuilding was being compiled, it was intended to tabulate statements of wages from employers and similar sources for workers in engine, machine and boiler shops and foundries in the second article, and for workers in shipyards in the third. Further consideration of the material, and of the conditions under which wage changes are arranged, has led to the conclusion that while this division would be convenient for some purposes, it is impracticable in the case of some shipbuilding centres, and in all others would lead to a large amount of unnecessary duplication. In so far as non-shipbuilding centres are concerned these have been brought together in the following series of tables comprising Part B, and with the trade union standard rates, published for the same and other internal centres in Part A of the series,¹ they are sufficient to give a good general view of the course of wages in general engineering as distinguished from marine engineering. In Part C it is proposed to deal with shipbuilding centres as regards both marine and general engineering.

The total number of authorities for the statements in this and the following article is greater than for trade union rates, but the really important sources are few; the chief of these is the *Returns of Wages, 1830-86* (C 5172), which contains statements compiled at different periods by local chambers of commerce. In general these returns are comparable with each other, and in some cases form a series of triennial statements from 1855 to 1883. The relative numbers employed in the various occupations are sometimes stated, and in such cases they are reprinted with the wages. Apart from this, the Wage Census of 1886 is the only official source of employers' statements. The reports of various Commissions contain some statements, especially those on Trade Unions in 1867, and on Trade

¹ *Journal of the Royal Statistical Society*, Vol. lxvii, part i, March, 1905.

Depression in 1886. We have been allowed the use of several returns compiled by various employers' associations, showing the rates at which the largest number were paid in each occupation (*i.e.*, the *modes*) at various centres in 1884, 1886, 1888, 1894, and 1897-98, and a similar return, showing the standard, or usual rates, for 1893, is to be found in the Webb Collection. These returns are of great value, as they show the rates not only for the chief occupations, but for many of the smaller ones for which few trade union statements have been found, as well as for helpers and labourers. The accounts of changes in standard rates, and of general advances or reductions in the rates of strikers, labourers, &c., in the *Changes in Wages* reports, enable us in many places to give an account of wages for each year since 1892.

In view of the large number of places for which important tabulations are possible, and the variety of the sources of information, it has been considered advisable not to give the references for each set of figures separately, but to compile a general code applicable to all the tables. The source of each column of statements is traceable by means of the letter given at its head, thus A, and where notes are given at the foot of the table or in the text following it, an italic letter is also given, thus A*a*. The following are the references:—

- A. *Returns of Wages*. C-5172, 1886, pp. 161—181, Engineering and Foundry Work.
- B. " pp. 181—190, Machinery.
- C. " pp. 201—207, Metal Wares and Brass Work.
- D. " pp. 209—223, Shipbuilding, Iron.
- E. " pp. 224—230, Shipbuilding, Wood.
- F. *Wage Census*. General Report. C-6889, 1893, Engineering and Machinery Works.
- G. " Iron and Steel Shipbuilding.
- H. *Webb Collection*. MS. Statement of Wages in the Chief Shipbuilding and Engineering Centres, and an account of Changes in Standard Rates on the North-East Coast since 1880.
- HH. " Other Employers' Statements.
- I. Edward Young. *Labour in Europe and America*, 1878.
- J. U.S.A. *Consular Reports*, 1878.
- K. " " 1884.
- L. Reports of the *Labour Commission*.
- M. " Royal Commission on *Trade Unions*, 1867.
- O. " " " *Depression*, 1886.
- P. Private Inquiries.
- Q. Clyde Shipwrights. *Report of Arbitration Proceedings*, 1877.
- R. Glasgow Municipal Commission on the *Housing of the Poor*, 1903. Minutes of Evidence.
- S. R. Montgomery. *Manchester in 1834 and 1884*. Manchester Statistical Society, 1884.
- SS. *Journal of the Statistical Society*, 1840, p. 412.
- T. Leoni Levi. *Wages and Earnings*, 1886.
- U. Sir T. Brassey. *Work and Wages*, 1872.
- V. " *Lectures on the Labour Question*, 1878.
- W. J. R. Macculloch. *Statistical Account of the British Empire*, 1846.
- X. Report of H.M. Inspector of Factories. H.C.—440, 1871.
- Y. Board of Trade. Reports on *Changes in Wages and Hours of Labour*, 1893-1903, and *Labour Gazette*, 1893—to date.
- Z. Returns of "Majority Rates," prepared by various Engineering Trades Employers' Associations, 1884, 1886, 1888, 1894, 1898.

In using the *Changes in Wages Reports* some difficulty is found in deciding what occupations received the change recorded. The following are the occupations to which the changes have been applied, in the absence of other evidence:—

Engineers.—Fitters, turners, millwrights, smiths, coppersmiths, and sometimes pattern makers and brassfinishers.

Engineers and Machinemen.—Planers, borers, slotters, shapers in addition to engineers.

Iron Shipbuilders.—Angle smiths, platers, rivetters, caulkers, chippers, holders-up in shipyards.

Boilermakers.—The same occupations in boilerships.

Labourers.—General labourers, fitters' helpers, boilermakers' helpers, platers' helpers on time work, and other unskilled occupations, including red-leaders (painters' labourers).

The other statements usually explain themselves, except that it is not always clear if the anglesmiths' strikers are included in the simple statement "strikers."

MANCHESTER.

The statements in the *Returns of Wages*, 1886, refer to "Manchester and neighbourhood," and probably include a very extensive area; this is not important as regards *boilermaking*, for the rates for all internal Lancastrian towns are the same, and change together (except in some cases angle-smiths); thus in 1879 the reduction of 4s. extended to 15 miles round Manchester, and in 1898 the rise of 1s. 6d. extended over all Lancashire except Liverpool and Barrow. In other engineering trades there are not only different rates in different towns, but even in the same town machine shops are often rated at 2s. a week below engine shops; in Oldham and some other towns the rates for engine, machine, and millwright shops are distinct. In 1875 Bolton engineers struck for a rise, and the engineers in Hyde, Stalybridge, Ashton, and other places struck for "Manchester wages;" the information as to the result is not definite, but apparently the increase was granted in Ashton.

The following series of columns are comparable within themselves:—B, 1839, 1849, 1859; M.T, 1851 and 1861-66; T, 1876 and 1884; W, 1840 to 1845; Z, 1884-86-88, 1894 to 1904.

There is considerable evidence that the standard time rates are paid for all skilled occupations, and as we can trace these back to 1870, we have reliable information as to the dates and nature of wage changes. *Engineers* (including patternmakers, at least since 1886):—Weekly rates rose 2s. in 1872, fell 2s. in 1879, rose 2s. in 1882, fell 2s. in 1886, rose 2s. in 1888, rose 1s. in 1896, and 1s. in 1897. *Boilermakers*:—Weekly rates fell 4s. in 1879, rose 2s. apparently in 1881 or 1882, fell 2s. apparently in 1886, rose at least 2s. and probably 4s. in 1888 and 1s. 6d. in 1898, and fell 1s. in 1905. In 1866 the *patternmakers* struck for a rise from 32s. to 34s., which was granted in some places, but not at the Atlas Works, to which columns M.T apply. In 1862 the *ironmoulders'* rate

took place in 1865. In 1879 they struck against a 2s. reduction, successfully according to the union report; but in other occupations this reduction took place.

a Full Week, Engineering, 1834—1904.

1849.	1851.	1859.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1870-71.	1872.
B.	M.T.	B.	M.T.	M.T.	M.T.	M.T.	M.T.	M.T.	M.	L.	L.
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
30	30·5	32	30·38	30·54	30·71	31·5	30·81	30·50	32, 34	—	34
32	30·27	32	31·33	31·62	31·57	31·38	31·93	32·30	26, 38	31·6	29
18	18·45	18	18·96	19·06	19·08	19·06	19·20	19·75	18, 21	17	20
20	} 19·87 {	22	} 21·86 {	21·24	21·15	21·72	21·27	21·5 {	22, 26	—	22, 29
20		18							18, 25	—	22
—		—							18, 25	—	—
18	—	18	—	—	—	—	—	—	—	—	—
20	—	18	—	—	—	—	—	—	—	—	—
30	} 30·18 {	32	} 30·44 {	30·30	30·23	30·24	30·47	30·56 {	26, 36	30	30, 32
34		33							26, 36	32	—
30		30							26, 36	30	30, 32
20		20							26, 36	—	—
32		32							26, 36	—	—
28	26·36	28	27·22	27·33	27·53	28·9	29·23	28·72	—	30	—
30, 34	—	30, 34	31·5	32·0	31·0	32·0	31·75	31·42	36, 38	—	—
28	—	28	—	—	—	—	—	—	—	—	—
20	—	30	29·75	30·2	31·0	31·2	31·0	32·4	32, 33	—	—
27, 28	—	27, 28	—	—	—	—	—	—	—	—	—
27	23·25	29	26·91	26·81	26·46	26·42	26·52	28·91	—	—	—
15	—	15, 6	—	—	—	—	—	—	—	16	18
34	—	34	34·12	32·24	32·62	33·54	34·44	—	36	34, 42	34
—	—	—	—	—	—	—	—	—	—	—	—
—	29·4	—	30·0	31·2	30·0	30·0	30·0	30·0	30, 32	18	—
—	—	—	—	—	—	—	—	—	—	22	30
30	—	32	—	—	—	—	—	—	—	—	—
—	36·0	—	35·5	35·5	35·5	38·0	38·0	38·0	38	—	—
—	29·66	—	32·77	33·44	34·0	36·0	36·28	36·0	36, 40	34	—
—	26·06	—	30·0	29·64	30·18	32·0	32·03	32·13	32	32	—
—	23·0	—	26·0	26·0	26·0	28·75	29·0	29·0	—	—	—
—	19·50	—	18·15	18·12	18·24	18·22	18·12	18·12	18, 20	—	—

TABLE 1.—MANCHESTER. *Wages in a*

Year		1874.	1877.	1880.	1880.	1883.	1883.	1884.	1884.	1884.	1884.
Authority ...		T.	B.	A.	B.	A.	B.	S.	S.*	T.	Z.
	Time or Piece.										
		S.	S.	S.	S.	S.	S.	S.	S.	S.	S.
Engine shops—											
Patternmakers.....	T.	30, 36	31	33 6	30	34, 36	33, 37	38	—	36	34
Smiths	T.	30, 45	32 6	31	28 6	32, 34	31, 35	—	36	32	33
„ strikers ...	T.	20, 24	20	17, 21 6	18 9	20, 21	18, 22	—	19 6	20	20
Planers	T.	18, 28	24	19 9, 26 3	21 9	22, 28	24 6, 28	—	—	22, 27	27
Slotters	T.		24	25 6	21 9	22, 24	24 6, 28	—			23
Shapers	T.		—	—	—	—	—	—			22
Screwers	T.		—	24	19, 23	19 6	—	—			18
Drillers	T.	—	24	19 6, 23	17 9	19, 21	19, 24	—	—	—	19
Fitters	T.	32, 38	31	28 6, 33	29	28, 34	30, 35	34	35	32, 38	32
Erectors	T.	32, 38	—	—	—	—	—	—	—	32, 38	32
Turners	T.	32, 35	31	27 6, 33	27	28, 34	29, 34	34	35	—	34
Borers	T.	32, 35	24	32 6	—	—	—	—	—	—	25
Millwrights	T.	—	32 6	35	31	28, 34	—	34	—	—	32
Joiners	T.	30, 32	29	28, 35	25 9	28	29, 37	—	—	32	—
Brassfounders	T.	32	—	34	32 6	—	30, 33	—	—	34	34
Brasfinishers	T.	—	—	—	—	—	—	—	—	—	32
Braziers and cop- persmiths	T.	—	—	—	—	—	—	—	—	—	—
Tinsmiths	T.	—	—	—	30 6	—	—	—	—	—	—
Painters.....	T.	26, 32	—	23 3	—	—	—	—	—	30	—
Labourers	T.	—	18	17 10	16 6, 18	17, 19	18 6	18	19	—	17
Foundries—											
Ironmoulders	T.	36	34	29 3, 36	27 6, 32	36	34, 37	38	34	36	36
Dressers	T.	—	—	26 8	24 9	—	25	26	—	—	—
Foundry labourers	T.	—	—	—	—	—	—	—	—	—	18
Grinders	T.	33	31	32	28 9	—	25, 31	—	—	32	32
Coremakers	T.	—	—	—	—	—	—	—	—	—	—
Boiler shops—											
Boilermakers	T.	—	34	—	—	—	—	—	—	—	—
Angleiron smiths	T.	40	—	38	—	40	—	—	—	38	36
Platers	T.	38	—	36	—	38	—	—	—	36	36
Riveters	T.	34	—	32	—	34	—	—	—	32	32
Holders-up	T.	31	—	29	—	32	—	—	—	29	29
Helpers	T.	19	—	—	—	—	—	—	—	19	17

S.* Average of seven shops.

L.§ The employer who made this return said the lower rates were the Trade

(a). The 1894 return brought up to the end of 1904, on the assumption that the

** Rate from 1900 to 1904.

LEEDS.

The additional sources of information for Leeds are the result of interviews with certain trade unionists in 1894, who gave an estimate (P*d*) of wages and numbers at that date to compare with the returns of wages (A) of 1880, and with certain employers who in 1905 very kindly gave complete and detailed information (P*a*, P*b*, P*c*) over long series of years.

Earlier statements were made by a Town Council Committee of Inquiry (SS) who reported on wages for 1839 (*Journal of the Statistical Society*, 1840), and by Inspector Baker, who gave in 1858 the following estimate to the Statistical Society (*Journal of the Statistical Society*, 1858):—

Full Week, Engineering, 1834—1904—Contd.

1886.		1886.	1888.	1891.	1893.	1894-95.	1896.	1897.	1898.	1899-1904.
F.		Z.	Z.	L s.	H.	Z.	(a).	(a).	(a).	(a).
Num- ber.	Average Wage.									
	s. d.	s.	s.	s.	s.	s.	s.	s.	s.	s.
81	34 8	32	34	38, 40	38	38	39	40	40	40
{ T. 47	32 11	31	32	36, 40	34/3	34	35	36	36	36
{ P. 14	42 -									
{ T. 59	20 2	19	20	24, 26	21/6	21, 22	22 23	23, 24	23, 24	23, 24
{ P. 15	25 8									
44	27 3	26	27	28, 36	29/3	28, 30	29, 31	30, 32	30, 32	30, 32
20	23 3	22	24	—	27	24, 28	26, 29	27, 30	27, 30	27, 30
14	22 2	—	24	—	27	24, 28	26, 29	27, 30	27, 30	27, 30
						19, 23	21, 25	22, 26	22, 26	22, 26
80	21 9	{ 17	18	—	22 6	20—26	22—27	23, 28	24, 29	24, 29
		{ 18, 19	19, 20	24—30	24—26	34, 34/3	35, 35/3	36, 36/3	36, 36/3	36, 36/3
341	31 11	30	32	34, 40	34/3	34, 34/3	35, 35/3	36, 36/3	36, 36/3	36, 36/3
—	—	30	32	—	34/3	34, 34/3	35, 35/3	36, 36/3	36, 36/3	36, 36/3
248	31 6	30	32	34, 38	34/3	34, 34/3	35, 35/3	36, 36/3	36, 36/3	36, 36/3
6	29 6	24	24	—	—	22, 28	24, 29	25, 30	25, 30	25, 30
13	33 6	30	32	34, 40	—	34, 34/3	35, 35/3	36, 36/3	36, 36/3	36, 36/3
63	31 5	—	—	—	33 9	—	(+ 1s.)	(+ 1s.)	—	—
3	34 6	32	34	—	38	34	36	36	36	36
—	—	30	32	34, 36	—	34	36	36	36	36
—	—	—	—	—	—	36	37	38	38	38
—	—	—	—	34, 40	32 6	—	—	—	—	—
{ 8	27 -	—	—	—	21/6, 29/3	{ 18s. and upwards }	—	—	—	—
{ 32	19 1	—	—	—	—	17, 19	—	—	—	—
392	17 11	17	17	20, 27	17/3	—	—	—	—	—
176	35 7	34, 36	36, 38	38, 42	38	38	39	40	40	40
80	24 4	—	—	28	25 3	28	30	30	30	30
See Labourers.	—	17	17	20, 24	21	18	—	—	—	—
—	—	30	—	34, 38	—	18, 20	—	—	—	—
44	24 10	—	—	32, 38	32	—	34	34	34	35**
—	—	—	—	—	—	—	—	—	—	—
—	—	36	40	—	40 3	40	40	40	41	41 6
16	36 8	34	38	—	38	38	38	38	39	39 6
19	31 7	30	34	34, 38	34/3	34	34	34	35	35 6
8	28 3	—	32	—	31 6	31, 32	31, 32	31, 32	32, 33	32 6, 33 6
—	—	17	18	—	20 6	19, 20	—	—	—	—

Union rates, which were their minima and the higher rates were their maxima, majority rates have risen similar to the rise of the standard rates.

Leeds Iron Trades.

	Number of Persons.	Weekly Wages.	
		s.	s.
Flax and tow machine making	2,630	25	to 28
Tool engineering and machine making	1,800	26	„ 30
Locomotive makers	2,400	} 28	„ 32
Other engineers, millwright, and } boiler-shops	1,740		
Other smiths' shops	450	12	„ 27
Jobbing brass and ironfounders	350	20	„ 24

He added that the rate of wages had not varied much for several years, but may have increased a little.

TABLE 2.—LEEDS. *Time Wages*

Year	1839.	'60-61.	1867.	1870.	1872.	'75.	'78.	1878.	1880.	1881.		'82.	1883.	'84.	'85.
Authority	SS.	A.C.	M.	P a.	I.	P a.	P a.	J.	A.	P b.		P a.	K.	Z.	P a.
										Numbers.					
Patternmakers.....	s.	s.	s.	s.	s.	s.	s.	s.	s.			s.	s.	s.	s.
Joiners	—	22, 28	27, 29	—	29	—	—	33/6	29	8	31	—	30/10½	32	—
Ironmoulders—															
Sand	25	26, 30	30, 34	—	34	—	—	—	30	10	30, 32	—	31/6	30	—
Loam	—	—	—	—	—	—	—	—	—	2	27	—	—	33	—
Coremakers.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fettlers and dressers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Foundry labourers ...	—	—	—	—	—	—	—	—	21	—	—	—	—	18	—
Brassmoulders.....	25	30	30, 34	—	—	—	—	—	30	—	—	—	—	32	—
Brassfinishers	—	35	—	—	—	—	—	—	—	—	—	—	—	26	—
Fitters	24	24, 28	26, 30	26, 28	30, 32	27	28	{ 29/6 31/6 }	26	41	26	28	28	28	29
Erectors.....	—	—	26, 30	—	—	—	—	—	—	—	—	—	—	28	—
Turners	22	24, 28	27, 30	26, 28	30, 32	27	28	{ 29/6 31/6 }	26	14	26	28	28	28	29
Millwrights	26	—	—	—	—	—	—	—	—	—	—	—	—	28	—
Planers	—	—	21, 24	—	23	20	21	—	21/9	9	21, 22	22	—	22	22
Shapers	—	—	17 to	{	—	—	—	—	—	3	18, 20	—	{ 20 to 24 }	21	—
Slotters	—	—	21	{	—	—	—	—	20†	—	—	—	—	22	—
Smiths... ..	19	—	26, 29	—	27, 28	27	28	{ 29/6 31/6 }	29/6	—	28	28	30/10	28	29
Strikers	—	—	16, 19	—	19	20	21	—	18/6	—	—	22	—	20	22
Fitters' labourers.....	—	16, 18	—	—	18, 20	—	—	—	17/6	20	17/6	—	19/6	18	—
Machine screwers ...	—	—	—	—	—	—	—	—	17/3	—	—	—	—	18	—
„ drillers	—	—	—	—	—	—	—	—	—	—	—	—	—	19	—
„ borers	—	—	27, 30	—	—	20	21	—	—	2	20	22	—	23	22
Hand drillers	—	—	—	—	—	—	—	—	—	—	—	—	—	20	—
Grinders ..	—	—	24, 26	—	—	—	—	—	27	—	—	—	—	27	—
Coppersmiths ..	—	30	32	—	—	—	—	—	—	—	—	—	—	—	—
Painters.....	—	—	—	—	—	—	—	—	23/9	—	—	—	—	—	—
Cranemen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Enginemmen	—	—	—	—	—	—	—	—	21	—	—	—	—	—	—
Boilermakers—															
Platers	—	—	30, 36	—	—	—	—	35/6	31, 39	—	—	—	—	36	—
Rivettters	—	—	24, 38	—	—	—	—	30	27	—	—	—	—	30	—
Angleiron smiths	—	—	28, 32	—	—	—	—	—	—	—	—	—	—	38	—
Holders-up	—	—	17, 22	—	—	—	—	24/6	20	—	—	—	—	24	—
Strikers	—	—	16, 19	—	—	—	—	22	18/6	—	—	—	19 7½	19	—
Labourers ..	—	—	—	—	—	—	—	—	17/6	—	—	—	19/6	17	—

* 1s. or 2s. above 1894 rate.

† Authority P (d) gives 22s.

‡ 2s. above 1894 rate.

in a Full Week. Engineering.

Numbers.	1885.	'86.	'88.	'90.	'93.	1893.	Numbers.	1894.	1894.	1896.	'96.	1897.	1897.	Numbers.	1904.	'05.	1905.
	P c.	Z.	Z.	P a.	P a.	H.		P d.	Z.	Z.	P a.	P a.	Z.		P c.	P a.	P b.
11	28	30	30	—	—	34	3	32	34	36	—	—	36	7	37 3	37	—
22	27 5	—	—	30	30	—	12	30, 36	—	—	31 6	32 7½	—	12	30 10	32	—
23	32	30	30	—	—	34	30	34	34	36	—	—	36	24	30 3	36	—
3	—	33	31	—	—	—	—	—	34, 36	—	—	—	36, 38	—	—	—	—
7	27 4	—	—	—	—	—	—	—	—	—	—	—	—	4	30 3	—	32
22	18	17	17 6	—	—	—	—	22	20, 22	20, 22	—	—	{ 22 to } 26	7	20 4	—	21
3	32 4	—	—	—	—	—	6	31	26, 32	26, 32	—	—	{ 26 to } 32	5	26 5	—	—
14	26 7	26	26	—	—	27 to 38	—	—	30, 32	30, 32	—	—	32	19	33	—	—
108	26 9	27	26	30	30	30	60	30	30	32	31 6	32 7½	32	113	32 2	33	92
129	26 10	26	26	—	—	30	—	—	30	—	—	—	32	68	32	—	—
66	26 5	27	27	30	30	30	30	30	30	32	31 6	32 7½	32	62	28	32	47
—	—	28	27	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27	21 5	22	22	22	21	24, 25	14	24	22, 26	*	21	21 4½	{ 24 to } 30	21	23 6	28	11
7	20 3	21	21	—	—	{ 23, 25, } 22	{ 12	—	21, 26	*	—	—	{ 22 to } 27	9	22 3	28	—
25	19 10	21	20	—	—	—	—	26	22, 24	*	—	—	—	19	24	28	15
29	28 8	27	28	30	30	31	20	29 6	28, 33	—	31 6	32 7½	{ 30 to } 35	17	32 10	36	—
52	19 9	19	19	22	21	19	20	18 6	{ 19 and } 20	—	—	—	{ 19 and } 20	19	19 10	22	—
—	—	17	17	—	—	18	40	17 6	18	*	21	21 4½	18	—	—	18	—
4	18 3	18	18	—	—	19	6	19	{ 18 and } up.	*	—	—	18	—	—	—	—
62	19	18	18	—	—	19	12	20	19, 23	*	—	—	{ 19 to } 24	64	20 9	—	8
11	23 4	23	23	22	21	26	—	—	26, 28	—	—	—	{ 27 to } 29	13	20 10	—	9
—	—	20	20	—	—	—	—	—	18, 20	—	21	21 4½	{ 18 to } 20	—	—	—	—
8	27 3	27	27	—	—	—	4	27	28, 31	—	—	—	{ 28 to } 31	13	21 2	—	—
4	27 3	—	—	—	—	—	2	31	34	—	—	—	—	5	30 2	33	—
42	23 5	—	—	—	—	27, 29	12	26	{ 18 and } up.	—	—	—	—	33	22	26	—
—	—	—	—	—	—	19	—	—	{ 18 and } up.	—	—	—	—	—	—	—	—
3	21 4	—	—	—	—	21	—	24, 34	{ 20 and } up.	—	—	—	—	5	23	—	—
13	30 4 8	34	34	—	—	36	10	34, 38	34, 38	+	—	—	—	15	35 8	—	—
24	26 11	28	28	—	—	28	30	30, 32	27, 32	+	—	—	—	34	31 9	—	—
9	32 4	36	36	—	—	38	3	38, 40	34, 38	+	—	—	—	8	40 6	—	—
—	—	—	24	—	—	24, 25	15	27	{ 26 and } 27	—	—	—	—	—	—	—	—
48	18 11	19	19	—	—	20	—	—	20	21	—	—	—	27	20 11	—	—
108	18 11	17	17	—	—	19	25	18, 21	18	—	—	—	—	91	18 5	—	19

§ Light platers.

|| Various labourers.

The *Returns of Wages* (A) for 1855-57 give the following difficult table [abridged]:—

Occupation.	Rates of Wages per Day.	
	<i>s. d.</i>	
Steam-engine building, millwright work, and boiler-making—		
Skilled persons { first class	5	6
second „	4	4
third „	2	8
Labourers or operatives, second class	2	6
Ironfounding and machine tool making—		
Skilled persons	4	to 5
Labourers or operatives	2	4 „ 2 8

Edward Young says, in 1871, that there had been a recent advance of 16 per cent. The Employers' Association report names a reduction of 5 to $7\frac{1}{2}$ per cent. in 1878, a general reduction in 1885, and a general increase of 5 per cent. in December, 1888. We hear also of an advance of 2*s.* in 1889 in engineering, restoring the reduction taken in the last depression, and of 2*s.* in engineering and 2*s.* in boilermaking in 1890 (trade union reports). In confirmation of these one of the firms visited found from its books records to the following effect:—

Fitters' and turners' wages previous to 1871, 26*s.* to 28*s.*; 1871, 14th October, the 9 hours' day was granted and a general advance given to all skilled labour; 1889, 23rd February, 1890, 6th June, and 1896, 1st August, general advance of 2*s.* each time; 1897, 2nd April, 53 hours' week granted; 1898, 10th November, advance of 1*s.* It is not, however, to be assumed that wages were unchanged from 1871 to 1889. There had been a reduction at any rate in 1878, restored in 1881, and between 1881 and 1889 "no reduction," but "rather a not inconsiderable increase." Trade union reports appear to show that wages in other firms followed a somewhat different course from 1871 to 1889. Another firm gave the following statement as illustrating the progress of wages:—

Ironmoulders.

1887.	1888 (January).	1889 (January).	1890 (February).	1890 (June).
<i>s.</i> 29	<i>s.</i> 29, 30	<i>s.</i> 30	<i>s.</i> 30, 32	<i>s.</i> 32, 34
1891-95.	1896 (July).	1897 (July).	1898 (December).	1899.
<i>s.</i> 34	<i>s.</i> 34, 36	<i>s.</i> 36	<i>s.</i> 36, 37	{ Probably 37 <i>s.</i> all round

The following tables, which will be used in more detail in a further part, are very important:—

Firm X. Numbers whose Nominal Weekly Time Wages were

Year.	15s.	16s.	17s.	18s.	19s.	20s.	21s.	22s.	23s.	24s.
1885.....	3	8	8	203	101	91	37	24	36	22
1904.....	2	—	6	117	59	66	81	42	22	28

Year.	25s.	26s.	27s.	28s.	29s.	30s.	31s.	32s.	33s.	34s.	35s.
1885.....	26	94	116	94	22	45	6	25	1	5	1
1904.....	23	22	28	13	13	16	16	13	152	43	17

Year.	36s.	37s.	38s.	39s.	40s.	41s.	42s.	General Average.	Median.	Total Number.
1885.....	7	—	2	—	2	—	—	^{s.} 22 10	^{s.} 23	979
1904.....	14	16	14	3	4	1	5	26	24	836

54 hours in 1885, 53 in 1904. The majority make time and a quarter.

Firm Y. Numbers whose Nominal Weekly Time Wages were

Year.	4s.	5s.	6s.	7s.	8s.	9s.	10s.	11s.	12s.	13s.	14s.
1889.....	7	24	41	39	34	29	33	44	23	11	4
'96.....	3	34	29	39	37	31	34	23	21	8	1
1905.....	0	9	22	38	39	40	35	35	17	17	4

Year.	15s.	16s.	17s.	18s.	19s.	20s.	21s.	22s.	23s.	24s.	25s.
1889.....	1	1	1	134	47	63	55	30	41	54	87
'96.....	3	2	0	52	42	35	41	29	22	38	49
1905.....	3	0	0	51	44	30	25	63	27	25	42

Year.	26s.	27s.	28s.	29s.	30s.	31s.	32s.	33s.	34s.	35s.	36s.
1889....	66	95	168	126	169	34	71	25	6	3	1
'96.....	51	41	40	21	193	55	40	18	23	14	12
1905....	23	16	44	45	34	14	42	207	61	39	32

Year.	37s.	38s.	39s.	40s.	44s.	45s.	General Average.	Median.	Total Number.
1889.....	6	7	1	3	—	—	^{s.} 22 11	^{s.} 25	1,587
'96.....	2	1	0	4	—	—	22 4	25	1,088
1905.....	22	24	2	10	1	1	24 7	27	1,165

Firm X. Numbers Employed.

	1885.	1904.		1885.	1904.
Fitters	108	113	Borers	11	13
Erectors.....	129	68	Drillers	62	64
Turners	66	62	Screwers	4	0
Brassfinishers	14	19	Labourers (various)	108	91
Smiths	29	17	" (boiler shop)...	4	12
Smiths' strikers	52	19	Strikers (boiler shop).....	48	27
Patternmakers.....	11	7	Brass crucible tenter.....	1	1
Grinders and glazers	8	13	Joiners	22	12
Angle smiths	9	8	Coppersmiths	4	5
Light platers	13	15	Painters and labourers ...	42	33
Riveters	24	34	Tappers	8	11
Ironmoulders	23	24	Tool grinders	7	8
Brass	3	5	Millers and slot drillers...	7	14
Coremakers	3	4	Plumbers	7	5
Foundry fettlers	7	7	Punchers and shearers ...	9	5
Cupola tenters.....	2	2	Enginemen	3	5
Foundry labourers.....	22	19	Miscellaneous	50	45
Platers	27	21			
Shapers	7	9			
Slotters	25	19	Total	979	836

Holders-up and platers' helpers are presumably included under strikers or labourers.

Firm Y. Numbers Employed.

	1889.	1896.	1905.
Mechanics.....	1,187	775	862
Smiths	52	43	53
Iron foundry	133	141	114
Brass	7	8	13
Model makers	35	19	20
Joiners	41	24	17
Labourers and painters.....	132	78	86
Total	1,587	1,088	1,165

TABLE 3.—*Series of Wages.*

Authority	Average Wage of all Employed at a Large Engineering Works in the WEST RIDING OF YORKSHIRE.	Standard Rate of Fitters and Erectors.	Rate at which Largest Number in the Works were Paid.	Rate for Fitters and Erectors in a Large Locomotive Works in the North of England.	
	P (<i>a</i>).	£.	£.	£.	
	<i>s.</i> <i>d.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>d.</i>
1837.....	—	—	—	23	—
'38.....	—	—	—	23	—
'39.....	—	—	—	24	—
'40.....	—	28	28	27	—
1841.....	—	30	26	27	—
'42.....	—	28	28	25	—
'43.....	—	28	24	25	—
'44.....	—	28	24	25	—
'45.....	—	28	24	25	—
'46.....	—	28	24	26	—
'47.....	—	30	24	26	—
'48.....	—	50	24	25	—
'49.....	—	28	22	24	—
'50.....	—	28	22	24	—
1851.....	—	28	22	24	—
'52.....	—	26	24	25	—
'53.....	—	28	24	25	—
'54.....	—	28	24	27	—
'55.....	—	28	24	27	—
'56.....	17 1½	28	24	27	—
'57.....	17 2	30	24	27	—
'58.....	17 4½	28	24	26	—
'59.....	18 ¼	30	26	26	—
'60.....	17 5¼	30	24	26	—
1861.....	17 3	30	24	27	—
'62.....	17 2¾	30	24	27	—
'63.....	17 4¼	30	24	26	—
'64.....	17 7¼	30	24	27	—
'65.....	—	30	25	28	—
'66.....	—	30	26	28	—
'67.....	—	30	26	28	—
'68.....	—	30	24	28	—
'69.....	19 1¾	30	24	28	—
'70.....	19 —	32	26	28	—
1871.....	19 4	32	26	28	—
'72.....	20 6¼	32	26	30	—
'73.....	21 6¼	32	26	30	—
'74.....	22 8½	32	27	31 6	—
'75.....	22 10	32	27	33 —	—
'76.....	23 ¼	32	27	34 3	—
'77.....	23 9¼	32	27	34 3	—
'78.....	23 2½	32	27	32 6	—
'79.....	21 6	30	26	33 —	—
'80.....	22 10½	30	26	30 —	—
				30 —	—
				28 —	—

TABLE 3.—*Series of Wages—Contd.*

Authority	Average Wage of all Employed at a Large Engineering Works in the WEST RIDING OF YORKSHIRE.	Standard Rate of Fitters and Erectors.	Rate at which Largest Number in the Works were Paid.	Rate for Fitters and Erectors in a Large Locomotive Works in the North of England.
	P (a).	Z.	Z.	Z.
	s. d.	s.	s.	s.
1881.....	22 5 $\frac{1}{4}$	30	26	30
'82.....	22 11	31	26	32
'83.....	22 10 $\frac{1}{2}$	32	26	34
'84.....	22 6	32	28	32
'85.....	22 7 $\frac{1}{4}$	32	27	32
'86.....	22 8 $\frac{1}{2}$	30	26	32
'87.....	22 11	30	27	32
'88.....	22 10	30	26	32
				34
'89.....	23 7 $\frac{1}{2}$	32	27	34
				35
'90.....	23 9 $\frac{1}{2}$	—	—	36
				—
1891.....	24 —	—	—	—
'92.....	23 10 $\frac{3}{4}$	—	—	—
'93.....	24 3 $\frac{1}{2}$	—	—	—
'94.....	23 11 $\frac{1}{2}$	—	—	—
'95.....	23 10 $\frac{1}{2}$	—	—	—
'96.....	24 3	—	—	—
'97.....	24 11 $\frac{5}{8}$	—	—	—
'98.....	24 8 $\frac{1}{4}$	—	—	—
'99.....	24 8	—	—	—
1900.....	24 3 $\frac{1}{2}$	—	—	—
1901.....	25 —	—	—	—
'02.....	24 6 $\frac{1}{2}$	—	—	—
'03.....	24 6	—	—	—

The first column shows the actual average of the wages paid by a firm, whose employees of all grades and ages numbered 152 in 1856 and 1,377 in 1903. Columns 2 and 3 appear, from internal evidence, to relate to a locomotive shop in Lancashire, and column 4 is believed to relate to a locomotive building shop on the Tyne.

SHEFFIELD.

The additional information is rather scanty, and is chiefly found in Trade Union Reports. As with Manchester, the *Returns of Wages* series includes Sheffield and neighbourhood, and wages at Rotherham at least were much lower than at Sheffield until recent years. The possibility of the inclusion of such neighbourhoods in one year and their exclusion in another year makes comparisons dangerous. We learn that the Ironfounders struck against an attempted reduction of 2s. in 1877, which was not carried out, and

TABLE 4.—SHEFFIELD. *Wages in a Full Week, Engineering, 1866—1904.*

Year	1866-68.	1871.	1878.	1880.	1880.	1883.	1884.	1886.	1892-95.	1896.	1897.	1898.	1899-1904.	1905.
Authority	A.	A.	J.	A a.	B.	A.	K.	F.	Z.	(a).	(a).	(a).	(a).	(b).
Time or Piece.														
Engine shops and foundries—														
Patternmakers	32 to 36	30 to 40	34, 36	28	33	30	32, 32/6	12	36	36	38	40	40	40
Ironmoulders	32 to 36	32, 34	36, 40	30	34	37	35	103	38	38	38	39	40	40
Dressers	—	—	28, 32	—	25	26, 29	26, 6	21	30	32	32	32	32	—
Coremakers	—	—	—	—	—	—	—	8	—	—	—	—	34*	34
Fitters	26 to 34	30	34	28	33	32	35	50	36	36	36	38	38	38
Turners	26 to 34	30	24, 36	28	32	32, 35	32	44	36	36	36	38	38	38
Millwrights	26 to 34	30	33	28	32	30	30	—	36	36	36	38	38	38
Planers	26 to 34	26	24, 36	—	29	26	—	19	32	32	32	34	34	34
Sloters	26 to 34	26	—	—	29	21	—	—	32	32	32	34	34	34
Borers	20 to 28	24	—	24	29	21	—	—	36	36	36	38	38	38
Screwers	—	18	—	24	28	18	—	—	20, 21	20, 21	20, 21	22, 23	22, 23	—
Drillers	20 to 28	21	—	24	28	24	—	19	23, 26	23, 26	23, 26	25, 28	25, 28	—
Smiths	26 to 34	30, 32	35	28	34†, 36†	31	31, 32/6	21	32, 40	32, 40	32, 40	34, 42	34, 42	38
Strikers	18 to 21	19, 24	—	20	21, 24	20, 6	21	22	20, 22	20, 22	20, 22	22, 24	22, 24	—
Coppersmiths	—	—	—	—	30	—	—	—	—	—	—	(+ 2 -)	—	38
Brassmoulders	—	—	34	—	—	—	35	—	38	38	38	40	40	—
Whitesmiths	—	—	32	—	—	—	30, 6	—	32	32	32	34	34	34
Grinders	26	22 to 50	—	33	40P.	—	—	—	—	—	—	—	—	—
Joiners	30	22 to 28	30	26	28	26	26	—	—	—	—	—	—	—
Labourers	18 to 24	18	20, 25, 6	19	20	20	18, 6	177	19, 20	19, 20	19, 20	21, 22	21, 22	—
Boiler shop—														
Platers	—	—	33	32	—	36	—	—	38†	38	38	38	40	40
Riveters	—	—	31	28	—	32	30	—	34	34	34	34	36	36
Holders-up	—	—	24	22	—	24	21	—	29	29	29	30	32	32
Helpers	—	—	20	—	—	—	18, 6	—	19, 8	—	—	—	—	—

A a. Nearly all the rates in this column seem too low.

(a). Majority rates, except for Brassmoulders, Sloters, and Platers, Riveters, and Holders-up, as given in Z brought up to date, on the assumption that the majority rates changed with the changes in the standard rates.

(b). Trade Union rates at 1st January, 1905. It will be seen that the standard rate is paid almost without exception.

* Rose from 32s. to 34s. in 1900.

† The Boilermaker figures, 1892 *seq.*, are from a separate return; the return from which the Engineers, wages come gives the Platers 33s. 9d., Riveters 26s. 9d., Holders-up 22s. 4½d., which are not typical for Sheffield.

TABLE 5.—Time Rates of Wages for an

Place	BARNSELY.					BATH.				
Year	1884.	1886.	1888.	1894.	1897.	1884.	1886.	1888.	1894.	1897.
Authority	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Patternmakers.....	33	32	32	28	36	31	30	32	30, 34	32, 34
Ironmoulders, sand ...	33	33	33	24 to 34	36	30	30	30	32	32, 34
Ironmoulders, loam ...	34	34	34	—	38	36	36	36	36	36
Dressers	—	—	—	20	—	—	—	—	—	—
Foundry labourers	20	20	26	16 to 25	19, 21	16	16	17	16, 18	16, 18
Brassmoulders	33	32	34	—	38	30	26	26	—	—
Brassfinishers	—	32	—	—	—	—	—	—	—	—
Fitters	31	32	32	24 to 34	35, 36	33	33	33	30, 33	30, 35
Erectors	31	32	32	—	36	33	33	33	30, 33	30, 35
Turners	28	30	30	20 to 30	35, 36	30	30	30	28, 33	28, 33
Millwrights	32	32	32	—	—	—	—	—	—	—
Planers	26	24	24	26	27	30	30	—	25, 26	28
Shapers	26	24	24	—	27	27	—	27	28	30
Slotters	26	24	24	—	27	24	24	—	24	28
Smiths	30	30	30	26 to 30	34, 38	30	30	30	27 to 34	29 to 34
Strikers	20	20	20	18, 20	20, 22	17	17	17	18, 19	18
Fitters' labourers	20	18	18	—	21	17	16	17	16, 18	18, 20
Machine screwers	—	—	—	—	—	18	21	19	20	20
„ drillers	24	—	—	—	21	18	18	18	18 to 24	18 to 26
„ borers	24	—	—	23	21	20	18	18	20, 24	24, 26
Hand drillers	—	—	—	—	—	17	—	—	—	18, 20
Grinders	28	25	—	23, 25	—	28	30	30	30	30

Place	BRADFORD.						HALIFAX.				
Year	60 to 63.	1884.	1886.	1888.	1894.	1897.	1884.	1886.	1888.	1894.	1897.
Authority	A.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Patternmakers.....	—	30	29	30	34	36	26	27	30	28, 33	33
Ironmoulders, sand ...	—	32	32	32	34	36	34	32	34	36	36
Ironmoulders, loam ...	—	34	34	34	36	38	32	32	—	—	40
Dressers	—	—	—	—	22	22	—	—	—	22	22, 6, 24
Foundry labourers	—	18	18	18	18	18	18	18	18	18, 20	22
Brassmoulders	—	—	—	—	—	—	—	34	34	36	38, 40
Brassfinishers	—	—	—	—	—	—	—	—	—	31	34, 36
Fitters	22	29	28	28	30, 33	32	30	28	30	30, 31	33
Erectors	—	—	—	28	—	32	30	27	29	—	—
Turners	22	29	28	29	30, 31	32	30	28	30	28 to 32	33
Millwrights	—	30	29	30	—	32	29	27	—	—	33
Planers	—	26	26	—	26, 29	—	29	27	27	27 to 31	28 to 33
Shapers	—	—	—	—	—	—	—	—	—	—	26 to 30
Slotters	—	23	—	—	—	—	—	—	—	—	26 to 30
Smiths	24	32	32	30	24 to 36	—	30	28	30	32	32 to 36
Strikers	—	20	18	18	18, 21	20	20	19	19	18, 20	21, 22
Fitters' labourers	—	18	18	18	18	18	18	18	18	18	21, 22
Machine screwers	—	—	—	—	18	—	—	—	—	—	22
„ drillers	—	22	22	23	22 to 25	—	20	20	20	18 to 24	20 to 28
„ borers	—	—	23	—	28, 31	—	30	28	—	—	28 to 31
Hand drillers	—	—	—	—	—	—	—	—	—	19	—
Grinders	—	32	29	29	29	—	—	—	—	21	—

(a). Standard rates at December.

Ordinary Week's Work in Certain Centres.

BIRMINGHAM.					LEICESTER.					NOTTINGHAM.						
'80.	1883.	'88.	1894.	1897.	'84.	'86.	'88.	1894.	1897.	1880.	1883.	1884.	'86.	'88.	1894.	1897.
B.	B.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	A.	A.	Z.	Z.	Z.	Z.	Z.
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
33	34, 36	36	36, 38	38	32	32	32	32	36	31 9	32	33	34	34	—	38
35	36 6	—	32, 36	38	32	32	32	34	36	32 3	32 3	34	34	34	2s to 36	36
—	—	—	36	38	—	32	—	—	—	—	—	36	34	—	—	36
22	23	—	20 to 28	27	—	—	—	22	23, 24	—	—	—	—	—	20, 24	26
—	—	—	18, 20	20	18	20	19	18, 20	19	—	—	20	20	20	21	18
35	34, 36	—	26, 32	34	32	—	—	—	36	—	—	34	34	34	—	36
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36
32	32, 35	32	34	36	30	30	30	26 to 32	34	30 3	—	34	34	34	34	36
—	—	32	34	36	30	32	—	26 to 32	36 to 40	—	—	34	34	34	—	36
32	32, 35	32	28 to 34	36	30	30	30	28 to 32	32	24 9	29	34	34	32	34	36
—	—	32	26 to 40	38	34	—	32	30 to 34	36	—	—	—	—	32	—	—
28	30, 32	28	24 to 34	34	24	26	—	28 to 34	28 to 32	24 9	29	26	24	24	24	—
—	25	—	24 to 30	—	—	26	—	26, 28	28 to 32	—	—	24	22	20	20, 22	—
28	30, 32	25	26 to 32	30 to 34	—	—	—	—	28 to 32	—	—	26	—	28	28	—
34	34, 36	32	32 to 36	36, 38	30	30	32	24 to 32	36	33 6	33 6	36	36	34	38	38
21	22 6	22	21, 24	24	18	19	18	19, 20	21	—	—	21	21	21	22	22
18	17 6, 19 6	18	18	18	18	18	18	18	20	19 6	19	20	18	18	21	18
—	—	—	18 to 23	24 to 34	—	20	20	21, 22 6	—	—	—	—	—	—	—	24†
22	21, 23	20	18	24 to 32	18	18	—	20, 22	26	24 9	19	21	22	—	21 to 28	24†
—	—	32	—	27 to 34	—	21	—	20, 22	26	—	—	—	—	—	—	24†
—	—	—	22	22, 24	—	—	—	—	20	—	—	—	—	—	—	24†
27	28 to 33	—	32	24	—	—	—	—	—	—	—	—	—	—	—	—

HUDDERSFIELD.								WAKEFIELD.				
1849.	1859.	'59 to '61.	1884.	1886.	1888.	1894.	1897.	1884.	1886.	1888.	1894.	1899.
B.	B.	A	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	(a).
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
—	—	26 9	29	30	30	2s to 31	30 to 35	30	28	28	30 & 36	32
26	28, 30	26 6	32	32	32	32	32 to 36	30	30	30	34	36
—	—	—	—	—	—	—	32 to 36	33	33	32	34	—
—	—	—	20	18	20	20	20 to 22	—	—	—	21	—
—	—	30	—	—	—	28	18, 20	29	19	19	—	—
—	—	—	—	—	—	—	32 to 36	—	—	—	—	—
23/6	26	28	27	26	28	28 to 30	30 to 34	28	26	26	28	30
23/6	26	28	28	26	—	—	30 to 34	28	—	26	—	—
23/6	26	27	26	26	28	26 to 30	30 to 34	28	26	26	26 & 30	30
23/6	26	28	26	26	26	—	30 to 34	30	—	—	—	32
—	—	21	20	20	20	20 to 28	20 to 26	22	22	22	24 to 32	28
—	—	—	20	20	20	22 to 24	20 to 26	20	20	20	20, 22	28
—	—	—	20	20	20	—	20, 20 6	20	21 6	22	24, 28	28
23/6	26	26	29	28	28	24 to 34	32 to 35	28	30	30	26 to 35	32
—	—	16	20	20	20	18 to 22	18, 21	21	20	20	20	—
17	18	16	29	20	20	18 to 21	20, 22	20	20	18	18	20, 21
—	—	16	18	18	18	18	20, 22	—	18	—	—	—
—	—	20	20	20	20	20 to 22	20, 22	20	20 6	22	20, 24	—
—	—	—	24	20	—	26 to 29	20, 22	22	20	20	20, 24	—
—	—	—	—	—	—	—	20, 22	—	—	—	—	—
—	—	—	25	28	28	24	26 to 30	32	—	30	30	28 to 32

† "And upwards."

that the Amalgamated Society of Engineers and the Steam Engine Makers combined to obtain a rise from 32s. to 34s. for their members in 1873. The rise was granted in January, 1874, after a strike. In 1878 a notice of a reduction of $7\frac{1}{2}$ per cent. (usually 2s. in the Lancashire and Yorkshire towns) was given, and took effect in January, 1879, when the rate became 32s. In March, 1886, the Amalgamated Society of Engineers reported an impending reduction. In 1889 the Steam Engine Makers were asking for a rise of 2s., and in September of that year the United Pattern Makers got a rise to this extent. In 1890 the Amalgamated Society of Engineers' rate rose 2s. to 36s.

Table 5 contains throughout the "actual rates paid, per week of 54 [or 53] hours, to the greatest number of men employed in any given department." The table shows "weekly ratings only, and does not in any instance include bonus or piece-work balances, which when worked vary from 25 to 50 per cent., as additions made to the weekly rates of wages show." Where more rates than one are quoted, it is to be understood that there is no distinct mode, but that approximately equal numbers are paid at the different rates. A fall of 5 to $7\frac{1}{2}$ per cent. or more is reported to have taken place very generally in 1878.

Birmingham.—In 1879 we learn of a reduction of ironfounders' wages, and in 1890 the Steam Engine Makers Amalgamated Society of Engineers and Patternmakers secured advances of 2s. per week. In 1891 the 53 hours' week was introduced.

Bradford.—Information relating to Bradford is scanty, but what little there is is important. In 1879 the Ironfounders' Report mentions a strike against the raising of hours for "the whole of the iron trade" from 54 to $56\frac{1}{2}$; one firm gave way, but the others were "unsettled." The ultimate result of this movement is doubtful, but apparently some firms did raise hours to $56\frac{1}{2}$ per week, as we read that later in that year the ironfounders were striking at one shop because wages had been reduced from 32s. and 34s. to 30s., and that notice was given to either reduce wages 2s. more or to work $56\frac{1}{2}$ hours. The shop was "closed" to union members.

In 1883 the Amalgamated Engineers struck for an advance, which was apparently granted, as in 1886 they report a notice of reduction. In 1892 the Steam Engine Makers report the notice of a reduction from 30s. to 28s., which was not enforced. The Boilermakers report increases of 2s. per week in December, 1888, and October, 1890. The United Patternmakers reported in September, 1889, that they were agitating for a rise of 2s., and that two-thirds had already obtained the increase. The report also states that whereas the rate for patternmakers who were members of the Amalgamated Engineers was 30s., their rate was 31s., with the result that all at 30s. got a rise of 2s., and all at 31s., 1s., and a further rise of 1s. to all in January, 1890. In 1892 they received a further rise of 1s. to 34s. In September, 1891, the "Engineering Trades" are reported to have asked for a rise of 2s. and a reduction of hours to 53, with the result that they got a rise of 1s. and the hours reduced.

Halifax.—The Friendly Ironfounders report a rise of 2s. in 1882, and the Amalgamated Society of Engineers report a rise in that year; a notice of reduction in 1886; a rise of 2s. "all round" in 1890; the maximum then being 31s.; and the establishment of the 53 hours' week in 1891.

Huddersfield.—The Friendly Ironfounders report a reduction of wages and an increase of hours to 56½ in 1879, and the Amalgamated Society of Engineers report a reduction "settled at 6¼ per cent.," after a strike against a rise of hours. In 1886 the engineers struck for a rise of 2s. and got it in two instalments of 1s. each.

Woollen Centres.—As there are gaps in the records for the Yorkshire centres, it may be useful to have collected together the rates returned for mechanics in mills, as they may serve to throw some light on the level of wages for an ordinary mechanic at certain periods. This has been done in the following table:—

	1858.	'60-63.	1866.	'67-68.	1871.	1874.	1877.	1880.	1883.
	s.	s.	s.	s.	s.	s.	s.	s.	s.
Bradford mechanics	21 to 28	24 6, 26	} 29	28	—	30 to 34	—	—	29 to 31/6
„ smiths	—	23, 26 6		—	—	—	—	—	—
Huddersfield mechanics ...	—	—	18 to 26	18 to 28	—	30	30 to 40	27	28
Halifax (worsted) mechanics	—	—	22 to 25	20 to 30	—	—	27 to 30	28	—
„ (wool) mechanics ...	—	—	—	27	—	—	—	—	—
Dewsbury mechanics	—	—	27	28	29	30	30	27	27
Batley mechanics	—	—	30	—	—	35	35	35	—

Nottingham.—The Friendly Ironfounders report a strike in 1872, "re nine hours," and that it resulted "satisfactorily." In 1887 they report a strike against an attempted reduction, "one already having been suffered."

In 1882 the Amalgamated Engineers report that they had conducted a successful movement for an advance, and that wages were now 34s. for fitters, turners, planers, and borers, and 36s. for patternmakers and smiths. In 1887 they report that the ironfounders, steam engine makers and themselves were involved in a strike, apparently only at one shop, against a reduction "from 34s. to 32s."

III.—*The Introduction of the words "Statistics," "Statistical" into the English Language.* By G. UDN YULE, *Newmarch Lecturer in Statistics, University College, London.*

SIR JOHN SINCLAIR, the organiser and editor of the first *Statistical Account of Scotland*,¹ appears to be generally regarded as the man who introduced the words *Statistics*, *Statistical* into our language. The writer of his life in the *Dictionary of National Biography*² is

¹ 20 vols., 1791-98.

² lii, p. 302.

quite definite: Sinclair, we are told, "was one of our earliest statisticians, and it was he who first introduced into the language the words 'statistics' and 'statistical.'" Dr. John,³ again, speaks of "Sinclair, welcher in seinem . . . Werke, *Statistical Account of Scotland* . . . den Namen 'statistik' zuerst in England einführte." Both statements are very probably based on a dictum in the *Monthly Review*⁴ for 1796 (in a notice of Durand's *Statistique élémentaire de la Suisse*), since quoted in *Notes and Queries*:⁵ "The word *statistics*, as the name of a peculiar science, was first engrafted into our language by Sir John Sinclair." As contemporaneous evidence, some weight has naturally been attached to this statement, and it has now been given greater publicity by inclusion in the *Century Dictionary*.⁶

Sir John Sinclair's earliest use of the adjective in published writings appears to have been in the "First Circular Letter to the Clergy of the Church of Scotland,"⁷ dated 25th May, 1790, in which we read: "In Germany, Statistical Inquiries, as they are called, have been carried to a very great extent," the phrase "Statistical Inquiries" being elucidated by an explanatory footnote, "Or, inquiries respecting the Population, the Political Circumstances, the Productions of a Country, and other Matters of State." In the *History of the Origin and Progress of the Statistical Account of Scotland*,⁸ the author further writes: "Many people were at first surprised at my using the new words *Statistics* and *Statistical*, as it was supposed that some term in our own language might have expressed the same meaning . . . yet, as I thought that a new word might attract more public attention, I resolved on adopting it, and I hope that it is now completely naturalised and incorporated into our language." This passage is so worded as to read very like a claim to be the introducer of the terms, and, as such, may, in conjunction with the passage in the *Monthly Review* given above, very well have served to mislead.

In point of fact I do not think it can be intended for such a claim. Sinclair speaks of *adopting* the terms, not *introducing* them, and the epithet *new* might very well be applied to words that had only been in use—and by no means general use—for a few years. Both the noun and the adjective occur in a work published three years before the issue of Sinclair's *Circular Letter*, viz., in Zimmermann's *Political Survey*,⁹ 1787, in the preface to which we read (p. ii): "It is about forty years ago that that branch of political knowledge which has for its object the actual and relative power of the several

³ *Geschichte der Statistik* [1884], p. 112.

⁴ xx, p. 553.

⁵ 6th Series, xi, p. 404 [1885].

⁶ Under *Statistics*, vii [1899], p. 5914.

⁷ Reprinted in *Statistical Account*, xx, App., p. xix.

⁸ xx [1798], App., p. xiii.

⁹ *A Political Survey of the present state of Europe* . . . by E. A. W. Zimmermann, Professor of Natural Philosophy at Brunswick. London, 1787. There is a copy in the Society's library.

modern States, the power arising from their natural advantages, the industry and civilisation of their inhabitants, and the wisdom of their governments, has been formed, chiefly by German writers, into a separate science . . . By the more convenient form it has now received . . . this science, distinguished by the new-coined name of *statistics*, is become a favourite study in Germany." And again (p. v): "To the several articles contained in this work some respectable *statistical* writers have added a view of the principal epochs of the history of each country." The preface is dated 30th March, 1787. The work appears to have been written in English and not translated (*cf.* preface, p. vii). It was noticed in the *Monthly Review*¹⁰ of the same year, the word *statistics* occurring in a passage in the review: ". . . the Germans who, he says, have distinguished that science which treats of the actual and relative powers of States by the new-coined name of *statistics*." In the body of the work, curiously enough, when foreign works are cited some periphrasis seems to be invariably used to translate "*statistik*," "*statistisch*," *e.g.*, on p. 3, "*Statistische Uebersicht, &c., Political Survey . . .*" "*Statistische Tabellen, &c., Tables on the present political state of Europe*," and on p. 65, "*Materialien zur Danischen Statistik, &c., Materials towards the knowledge of the state of Denmark*." Unless then any earlier uses can be found, it would seem that not merely was German the first European language into which the term *statistik* or its equivalent was introduced, but also that we are indebted to a German for the introduction of the words *statistics*, *statistical* into English. The name of Zimmermann does not occur in von Mohl's *Geschichte der Staatswissenschaften*, in John's *Geschichte*, or in Mr. Palgrave's *Dictionary of Economics*, although Zimmermann's work appears to have been well known at the time. Eberhard August Wilhelm von Zimmermann¹¹ (1743-1815) was trained for the profession of medicine, and appointed Professor of Mathematics and Physics at Brunswick in 1766. He was an original writer on a great variety of subjects—Physics, Anthropology, Zoogeography, and Statistics—and translated into German, *inter alia*, Arthur Young's *Tour in France*. With financial assistance from the Government, he made several journeys to the different countries of Europe for the immediate purpose of statistical investigation.

To follow the history of the terms further, Sir John Sinclair's *Circular letter* does not afford the next known illustration of their use. In the *Monthly Review* for 1789¹² occurs a notice of a work under the following heading:—

¹⁰ lxxvii [1787], p. 324.

¹¹ *Allgemeine Deutsche Biographie*. His works are well represented in the British Museum.

¹² lxxxi [1789], p. 175. This reference is given by Lueder, *Geschichte der Statistik* [1817], p. 470, footnote, the statement in the text being, "*Selbst in England, wo doch erst im Jahre 1789 die Statistik als eine neue Wissenschaft dem Publikum angekündigt wurde . . .*" It would seem that Lueder must have taken the reference at second hand, for, as is stated below, the *Review* refers directly to Zimmermann's work of 1787.

Political Geography. Introduction to the statistical Tables of the principal Empires, Kingdoms, and States in Europe, 35 pages, 4to., and Four Tables on Royal paper . . . Lowndes, 1789.

The notice commences with a reference to the review of Zimmermann: "In the 77th volume of our Review, p. 324, we gave an account of a work similar to the present, where the new science, called *Statistics*, is described." I am sorry to say I have not seen this work, nor even any reference to it elsewhere. I cannot trace it in the catalogue of the British Museum.¹³

In the following year, 1790, in addition to Sinclair's letter, we find a use of the adjective in the title of Thomas Brooke Clarke's *Statistical View of Germany*.¹⁴ It would seem probable that Clarke borrowed the term from Zimmermann. He cannot have regarded it as new, for no definition is given, and on p. vi is a footnote stating that, having been long absent from England, he had only heard of Zimmermann's *Political Survey* on transmitting his MS. to the bookseller. This would, however, allow time enough to include the adjective in the title page, and in the text it does not seem to occur.¹⁵

In 1791, the year in which the first volume of the *Statistical Account of Scotland* was issued, there were also published two further works by T. B. Clarke, in the titles of which the adjective occurs, viz., *A publicistical Survey of the different forms of Government of all States and communities in the world, with a statistical chart*,¹⁶ and *A statistical view of Europe*.¹⁷ No definition of "statistical" is given in either case, although in the *Publicistical Survey* a definition of "Publicistics" is inserted on the page facing title. The issue of these two works by Clarke probably just preceded and followed the issue of Sinclair's

¹³ Can it possibly be identical with a work cited by Meusel (*Litteratur der Statistik*, 2nd ed. [1806], p. 15), "*Statistische Uebersicht der vornehmsten Teutschen und sämmtlichen Europäischen Staaten . . .* (von Joh. Adolph Friedrich Randel) . . . Berlin . . . 1786. English, von Dr. Clarke. London, 1788"? Neither original nor translation is in the British Museum. Dr. Clarke, I should imagine, would probably be the Thomas Brooke Clarke mentioned below; on the title-page of his *Survey of . . . Great Britain* he is termed the "Rev. Dr. Clarke, Secretary for the Library, &c., to H.R.H. the Prince of Wales."

¹⁴ Svo. [1790]. I would like to express my indebtedness to Dr. J. A. H. Murray for directing my attention to Clarke's works, to the references in Watt's *Bibliotheca Britannica*, and to the passage from the *Monthly Review* for 1796 reproduced in *Notes and Queries*.

¹⁵ Watt's *Bibliotheca Britannica* refers to "*a Statistical Account of the Parish of Aghaboe*" by Edward Ledwich, 1790, but the date is evidently a misprint for 1796. The latter is the date of the British Museum copy, there is no evidence of an earlier issue, and the author refers in his preface to the *Statistical Account of Scotland*.

¹⁶ 4to. [1791]. The "chart" is a table, not a diagram.

¹⁷ Svo. [1791]. This is in the Society's library, but not in the British Museum.

first volume. The latter¹⁸ was published on 25th May, 1791, exactly a year after the issue of the First Circular Letter. The preface to Clarke's *Statistical View of Europe* is dated June, 1791, and the *Publicistical Survey* was issued earlier, seeing that it contains an advertisement stating that the former is "to be issued shortly." I may mention here that I have searched the tables of contents of the *Monthly Review* for 1790-91-92 (vols. i to ix), but cannot find any notices of Clarke's works. The name of Clarke does not occur in the *Dictionary of National Biography*, where I hoped to find a bibliography, nor in the *Dictionary of Economics*.

It is of course just possible that Sir John Sinclair may have used the terms Statistics, Statistical in some unrecorded passage prior to the Circular Letter of 1790. It is even possible that he may have so used them prior to the issue of Zimmermann's work in March or April, 1787,¹⁹ for in the *Statistical Account of Scotland*²⁰ he informs us that it was while on a tour in 1786 he found "that in Germany they were engaged in a species of political inquiry, to which they had given the name of *Statistics*." There is however no evidence in favour of such an earlier use save the statement of the *Monthly Review* of 1796, while the Reviewers of 1787 and 1789 do not mention Sir John Sinclair at all. It may be added that in the notice of the *Statistical Account of Scotland* (vols. 1 and 2) in the *Monthly Review*²¹ of 1792, nothing is said as to the author being the introducer of the term "statistical."

It cannot be argued, I think, that Sir John Sinclair may have been ignorant of previous uses of the terms, and have introduced them independently. Such a supposition would be unlikely in any case, and is negatived by the fact that he specifically mentions Zimmermann:²²—"It is unfortunate that German literature is so little cultivated in England; hence the mass of statistical information, collected in that part of the Continent, would probably have been little known here, had it not been for the *Political Survey of the Present State of Europe*, written by Professor Zimmermann. In that ingenious and interesting work we have an abstract of all the information which the Germans had accumulated. . . ." As further general evidence that Zimmermann's work was well known, I may cite an interesting mention of it in B. P. Capper's *Statistical Account of the Population and Cultivation . . . of England and Wales*,²³ in which he states that writings on statistics have "been attempted by many latterly since Professor Zimmermann gave his *Political Survey of Europe*." Capper appears from the passage to regard Zimmermann as the "father" of the subject in England, although he also cites Sinclair.²⁴

¹⁸ *Statistical Account of Scotland*, xx, App., p. xiv.

¹⁹ The date of the preface, as mentioned above, is 30th March, 1787.

²⁰ xx [1798], App., p. xiii.

²¹ viii [1792], p. 285.

²² *Statistical Account*, xx, App., p. lxxiv.

²³ 1801, p. vii. The tract is in the Society's library, but not in the British Museum.

²⁴ *Ibid.*, p. xiii.

On the facts before me, I only find it possible to suppose that the Reviewer of 1796 wrote in ignorance, and that Sir John Sinclair's statement about "the new words *Statistics* and *Statistical*" is meant for an apology and not a claim.

I should have thought that Sinclair's work was sufficiently well known to render it impossible for anyone to assign the introduction of "statistics," "statistical" to a *later* date than 1790-91, yet somehow a myth seems to have arisen that the above-mentioned B. P. Capper (1801) was the introducer. In Todd's edition of *Johnson's Dictionary* (1818) it is stated under the heading *Statistical*, *Statisticks*, "This word as well as the substantive is of very recent date in our language," and under *Statisticks*, Capper's definition is given. The same statement is carried forward into a later edition of Todd (1827). In *Richardson's New English Dictionary* (1836-37) we find "Statistick . . . is a word for which we are said to be indebted to a living writer," and Dr. Guy²⁵ assumes this, *without comment*, to be B. P. Capper! It is worth noting that the same statement about the *living writer* is reproduced *verbatim* in a re-issue of *Richardson's Dictionary* in 1863, and it would be interesting to know whether Dr. Guy referred to the re-issue or the first edition. Sir John Sinclair died in 1835. The name of Benjamin Pitts Capper does not occur in the *Dictionary of National Biography* or in the *Dictionary of Political Economy*, but the date of the latest work under his name in the British Museum catalogue is 1815.

IV.—Notes on Economic and Statistical Works.

Grundriss zum Studium der politischen Oekonomie. By Dr. J. Conrad. Vierter Teil. Statistik. II Teil. *Die Statistik der wirthschaftlichen Kultur.* 1 Hälfte. *Berufsstatistik, Agrarstatistik, Forst- und Montanstatistik.* x + 233 pp., 8vo. Jena: Fischer, 1904.

The portion of Dr. Conrad's "Grundriss" devoted to statistics opened with a first part, on population statistics (including a short introduction on history and theory), which attained a second edition in 1902 (*Journal of the Royal Statistical Society*, lxvi, p. 160). This is a new instalment—or the first half of a new instalment—devoted to statistics of Industry and Agriculture, or, more generally, of Production; the second half on Statistics of Trade and Consumption, may be expected during the autumn of the present year. There will still be a third part to complete the series on "die Statistik der geistigen Kultur."

The present part is divided into four main sections—apart from a brief introductory statement—on statistics of occupations, on agricultural statistics, on forestry, and on mining and metallurgy respectively. In each section statistics from the chief countries of

²⁵ *Journal of the Statistical Society*, xxviii, 1865, p. 482.

Europe and from the United States are, as far as was possible to the author, brought together for comparative purposes. Dr. Conrad himself states in his preface that no complete statistical library was always at his disposal, and hence some lacunae, and somewhat numerous instances of figures quoted at second-hand. The volume will nevertheless form a valuable work of reference for both statisticians and economists on the subjects of which it treats. Foreign statistics are frequently difficult to obtain, or, when obtained, to appreciate at their proper value, and Dr. Conrad's explanatory text is a useful commentary. There is, unfortunately, no index, and the want is only partly met by a detailed table of contents, which includes the titles of all tables.

Considered as part of a work for the edification of the *student* of economics, and not merely as a work of reference, it might be as well, in a future edition, in the first place to considerably extend the somewhat curt introduction, and, in the second place, to give some general summary either at the end of each section or, preferably perhaps, at the end of the volume. The present introduction is a little inadequate; it is all very well to state that the extraordinary importance of statistics of trade and industry (*Wirtschaftsstatistik*) to the national economist is obvious from the mere definition of the terms. Nothing more frequently strikes the statistician than the manner in which economists neglect statistical data, and their importance, consequently, should be very fully illustrated and enforced. Surely a few pages devoted to this end would not be amiss? Again, in the several sections an immense mass of material has been collected for illustrating the state of different countries at different periods, but it is very largely *raw* material—loose collections of disjointed facts. Succinct and lucid verbal summaries, sketching in broad outlines the relative conditions of different countries and the more important changes of the last few decades, would not only emphasise again and again the economic importance of the data, but would enable the student, old or young, to grasp their meaning in a way that is hardly at present possible. No one is so well fitted as Dr. Conrad himself to undertake such a summary presentment of the results, which would, we feel sure, add very largely to the value of his work and but little to the bulk. A second edition is sure to be called for within the next few years, when the opportunity might be taken to make some such addition as is suggested.

G.U.Y.

Statistische Beiträge zur Beleuchtung der ehelichen Fruchtbarkeit.
By A. N. Kiaer. Dritter Abschnitt. 164 pp., 8vo. Christiania: Jacob Dybwad, 1905.

The first and second sections of these "Contributions," devoted to a synopsis of the available statistical material relating to births, and to a discussion of the available data as to the proportion of childless to total marriages respectively, were issued in 1903, and noticed in the *Journal* for that year (p. 725). The present (third) section, concluding the work, presents a similar collection of all available data as to the distribution of numbers of children in

fertile marriages, with a discussion of such points as the influence of duration of marriage, of the age of husband and wife, of social position, and of urban life. Both for its references and its wealth of tables the work will be indispensable to all who are working at the problems connected with birth-rates.

The data available as regards different countries are, as might be expected, of very different extent and value. Great Britain, unfortunately, possesses no official statistics on the subject at all; the only tables quoted by Kiaer are taken from Ansell's *Statistics of Families* (1874) and from the reprint of a paper by Miss Beeton, Professor Pearson and the present writer in the *Journal of the Institute of Actuaries* (the original reference is to the *Proceedings of the Royal Society*, vol. 67, 1900). The data in Professor Pearson's paper on "Genetic Selection" in the *Philosophical Transactions*, vol. 192 (1899) might have been mentioned, and reference should also be made to the work of Matthews Duncan (*Fecundity, Fertility and Sterility*: Edinburgh, 1st edition, 1866, 2nd edition, 1871). When the systematic registration of births was commenced in Scotland in 1855, a much more elaborate schedule than the present was employed, the ages of mothers and the number of the birth (first, second, third, &c., child) being, *inter alia*, returned. Dr. Duncan's book contains a very thorough discussion of this material for the births recorded under this schedule in Edinburgh and Glasgow.

G.U.Y.

The Elements of Railway Economics. By W. M. Acworth, M.A. 159 pp., crown 8vo. Oxford: The Clarendon Press, 1905.

This interesting little book, Mr. Acworth tells us, is "only an instalment" of a "complete work" which he had "planned;" and by the "half loaf," as he modestly describes the portion offered now for our digestion, he has whetted our appetite for the full satisfaction which we trust that at no great interval he will be able to supply. He has furnished here an admirable *résumé* of the subject, and has shown that it is capable of more detailed treatment than is possible within the limited compass of the hundred and sixty pages of which the present volume consists. And yet within these dimensions he has contrived to indicate points of view which will be novel to the uninstructed layman, and are nevertheless essential to a correct or comprehensive judgment of the policy pursued by railway-managers, and of the adverse criticisms lightly formed but lavishly bestowed by an indiscriminating public. That public, Mr. Acworth urges, is content with the superficial appearance of affairs, and does not trouble to penetrate below a *prima facie* statement of the case, or endeavour to discover and appreciate the actual fundamental circumstances.

A large part of his restricted space accordingly is not unnaturally occupied with the close consideration of railway charges, and more especially of those for the carriage of goods; for that question has concentrated upon itself the notice of would-be railway reformers, and has recently received the attention of our Legislature. Mr. Acworth is dissatisfied with this legislation, because he holds

that it may be likely to produce results which were not intended, and may possibly, or even probably, prevent rates from being lowered to the level at which, had railway-managers commanded greater freedom, they would of their own motion have been disposed to fix them. For in effect the action of the Legislature withdraws the power of raising a rate which has once been lowered, although changing conditions may easily render such an alteration just, and not merely expedient. And accordingly railway-managers will in future be very chary of reducing rates. This action of the Legislature Mr. Acworth traces to the uninstructed ignorance of the general public, which does not know the fundamental rules determining the settlement of railway rates, but is led astray by fanciful ideals, which hardly admit of practical embodiment, or is prejudiced by an unfortunate misunderstanding of the actual facts.

He allows indeed that the new statutory classification adopted in the latest Act is a "great benefit to all parties." "Simplicity and uniformity," he acknowledges, have been "substituted for a welter of confusion and contradiction." But none the less the plain man, he contends, cannot or will not grasp the full significance of the only possible working maxim of railway administration, that of "charging what the traffic will bear." He thinks that an obvious injustice is being manifestly done to certain localities which are asked to pay proportionally or even absolutely higher rates for the carriage of their goods or their inhabitants than others situated at a greater distance from the common goal to which they are conveyed. And yet the traffic from the longer point can only be obtained, owing probably to the competition of alternative routes or modes of transport, by the lower charge, and the circumstance that it is thus secured enables the railway company to conduct its general service more profitably and inexpensively than would otherwise be possible, and the raising of the rates at which the specially favoured traffic is conveyed would not enable the charges from the nearer places to be lowered, but, on the contrary, might compel their increase. They do not suffer therefore, but are likely to benefit, by the adoption of the principle of charging what the traffic will bear.

For, as Mr. Acworth shows, this maxim does not mean, as it is often carelessly interpreted, charging what the traffic will not bear, but what it will, and he ingeniously and instructively contends that the maxim is observed in many other departments of practical affairs, with a similar result in variations of the charges made to different kinds of customers. It is at least suggestive that the more recent developments of economic theory, as expounded in the ordinary text-books upon principles, lend effective, if indirect, support to such a maxim; and it is hardly fanciful to regard it as an application of the central theory of value, not indeed in the older cruder form which, like some railway reformers of to-day, laid exclusive emphasis on cost of production, but in the more modern comprehensive shape which attaches due importance to the final or marginal utility of the service rendered or the commodity supplied.

The casual reader may perhaps derive from the largeness of the space thus given in Mr. Acworth's book to the explanation and enforcement of this maxim, an impression that, if this rule forms, as it appears to do, the staple of railway economics, the claim for the appropriation of a separate department of scientific study to their treatment is hardly justified. That claim, however, has been urged by no one with greater force than Mr. Acworth in this country, and it has been recognised in the United States in far completer measure than is yet the case on this side of the Atlantic. Such a critic may consider the theory of "railway economics" somewhat thin, and hardly adequate for formal exposition in a course or several courses of instruction. But, if he consults the earlier chapters of even this instalment of the larger work which we may now, we hope, expect from Mr. Acworth, he will soon perceive that on those historical and statistical sides of Economics which have in later years been given greater prominence by students and instructors, "railway economics" is capable of great expansion. Mr. Acworth shows, for instance, that the original circumstances among which railways arose in this country still exert an influence, which is not wholly beneficial, on the preparations and the public issue of the statistics of railway expenditure, and that the conditions under which railway capital has been raised have an important bearing, often neglected by the lay spectator, on the verdict passed on railway administration. Nothing but good, at any rate, we imagine, can result from affording to those actually engaged in the daily work of railway business an opportunity of opening their minds by the systematic study of the larger problems presented in railway economics; and a decided movement in this direction has, as Mr. Acworth mentions in his preface, become evident in this country also in the last few years. We may be allowed to add that no more capable expositor of a subject, which he has made his own, in the fullest sense of the term, could be found than Mr. Acworth, and his account, as all who know his previous writing would expect, is as readable and lucid as it is definite and convincing. His introduction to the subject is, in short, as ably executed as it is happily conceived.

L.L.P.

Industrial Conciliation and Arbitration. By Douglas Knoop; with an Introduction by Professor Sidney J. Chapman. xxiv + 241 pp., crown 8vo.

In this essay, which was written originally in competition for the Shuttleworth Scholarship in the University of Manchester, Mr. Knoop has made a valuable and opportune addition to our economic literature. It is opportune because from the intrinsic importance of the subject there can be few, if any, questions of more immediate interest to the inhabitants of that busy trading district, of which Manchester is the centre—and in no other manufacturing industry of this country, we may add, has the machinery of industrial peace itself been carried to a more complete degree of adaptation and efficiency than it has in cotton—and it is also opportune because, in view of recent notable developments of compulsory arbitration

in our Australasian colonies, which have been recommended by persuasive advocates for imitation, the moment is not unsuitable for emphasising, as Mr. Knoop, in our opinion, rightly does, the great success which has attended the voluntary methods practised in this country. There is also a certain appropriateness in pointing out, as Mr. Knoop has occasion to do in the course of his essay, that in this respect we are at present far ahead of the United States; for they apparently are only now approaching a stage which we have for some time left behind. Here again Mr. Knoop is undoubtedly correct in drawing the attention of his readers to the significant established fact that it is the trade rather than the district boards which have been markedly successful in this country, and that, while some national institution resembling the National Civic Federation recently instituted in the States might possibly fulfil an useful office on this side of the Atlantic also, yet we have little to learn from the Americans in the pacific settlement of wage-disputes, or their entire prevention, by trade-boards, but they, on the contrary, have much to learn from us.

Mr. Knoop, indeed, in his final chapter, distinguishes three stages of progress in the history of industrial relations. The first and earliest is that which New Zealand and Australia have attained, where strikes are few, but industry is still conducted on the limited scale appropriate to infancy. The second is that of strained industrial relations, issuing frequently in open violent conflict forcibly repressed, and the third is that of industrial peace. The United States are still in the second intervening stage; but Great Britain has reached the final stage, after passing previously the earlier two. It has seen, and has abandoned, that compulsory arbitration by the State which our Australasian colonies are adopting; and it has also experienced and discarded the industrial warfare prevalent in the United States. These distinctions, if suggestive, may be somewhat arbitrary; but the actual progress achieved by voluntary trade-boards in this country during the last quarter of a century is incontestable, although it may not yet have been appreciated fully by the general public. Nor are the criticisms passed by Mr. Knoop upon the ascertained results of State arbitration in New Zealand and Australia otherwise than pertinent; and the commentary which he offers on the arguments put forward by its leading advocates are no less forcible and just, than they are founded evidently on long study and wide knowledge.

The great value, in fact, of his work consists in the plain indications which are manifest of his full and accurate acquaintance with the available material. Of the statistics which are published he has made such use as their deficiencies admit, and they serve to establish or confirm some of his main conclusions. Here, however, as in so many other instances, international comparisons are met by the serious obstacle that the data furnished are not strictly comparable. And yet certain significant and curious results can be established by their aid. For instance, in the case of what Mr. Knoop calls voluntary State conciliation and arbitration, the figures show that in England nearly half the applications made for

the mediation of the State under the recent Conciliation Act were put forward by both parties jointly, and of the cases settled by this means two-thirds were adjusted by an arbitrator. In France, on the contrary, only $2\frac{1}{2}$ per cent. of the applications were made jointly by both parties, and some 80 per cent. of the cases were settled by conciliation. The explanation is discovered in the circumstance that in England the proper office of the State is to supplement a developed system of voluntary arbitration and conciliation, while in France no such system has been hitherto established on any extensive scale. The position in the United States is not dissimilar from that in France.

But the presentation and examination of the statistical data is but one part of Mr. Knoop's comprehensive task, although he has made a larger and more effective use of this material than previous writers. He has gathered together this particular class of information from the most various sources; but his industry in this respect is typical of the general character of the useful work he has accomplished. He has in fact explored the literature of the subject with unflagging pains. The full bibliography appended to his essay testifies at once to the energy with which he has prosecuted his researches, and also to the advance which has been made in the detailed study of the question since earlier books upon it were prepared and published. From the large practical experience which has now been gained, and from the repeated investigations made of the notable experiments which have been tried, it has become possible to fix with definiteness the most likely conditions of success, and also to discern the most probable causes of disappointment or disaster. One important distinction, which Mr. Knoop duly emphasises, has been drawn between the minor differences connected with the interpretation of a past agreement, and the detailed application to individual or local circumstances of a common agreement reached for a whole district or an entire trade, and the larger questions of the comprehensive arrangement of general wages for the future of some entire industry. The superiority of conciliation to arbitration has also been more fully recognised, as the two terms have been more clearly and exactly separated from each other; and the elucidation of mental confusion has in this, as in other cases, been accompanied by practical improvement. All this is shown with diligence and with exactitude in Mr. Knoop's successive chapters, and, although some little crudeness of expression and some occasional immaturity of thought might be detected by the unkindly critic in what was, in its inception at any rate, an academical exercise, yet the essay as a whole fully deserves the commendation given to it by Professor Chapman in his Introduction. Mr. Knoop has covered the entire ground. He has investigated a vast quantity of material. He has digested the knowledge thus acquired. He has adopted a lucid and convenient order of arrangement, and, by dint of the admirable qualities he has shown, he has been enabled to present in a compendious shape a great mass of useful, and indeed necessary, information for future students of the question.

L.L.P.

Report to the Board of Trade on Agencies and Methods of dealing with the Unemployed in certain Foreign Countries. By D. F. Schloss. [Cd-2304.] London: Eyre and Spottiswoode, 1904.

The information contained in this report is of a most interesting nature, and is of great assistance in clearing one's ideas as to possible methods of attempting to deal with the ever recurring problem of the unemployed. The variety of schemes mentioned in this report is great. Schemes of insurance against unemployment exist or have existed in the German Empire at Cologne and Leipzig, in Switzerland at Berne and St. Gall, and in various towns and provinces in Belgium. All schemes of this nature have depended generally to a large extent upon subvention from public authorities. So long as this is so, it may be doubted whether they can be considered satisfactory. If the wages earned by a workman when he is in work are not sufficient to enable him to pay what is an adequate premium to an insurance fund—as is practically the case where a workman belongs to a trade union which pays an out-of-work benefit—it is clear that such workman is not, taking good and bad times together, receiving a wage adequate for his support. On the other hand, if the wage is adequate for this purpose, it may be desirable to compel the workman to insure. But the practical difficulties of compulsory insurance are great. Probably in England, for some time at least, we must trust to trade unions to provide out-of-work benefit. Another method which aims at reducing the amount of unemployment is that of establishing labour registries properly connected and co-ordinated, so that a man out of work can find out what demand there is for work in his trade over a very large area. The German system of labour registries is of the greatest interest, and deserves the most careful study. The provision of relief stations (in connection with labour registries), where a workman travelling in search of employment can get relief without coming under the provisions of the Poor Law, assists the mobility of labour in a most useful way. An adequate provision of labour registries and relief stations might do much in this country to diminish unemployment. The casual ward in this country has many disadvantages. Nothing is done to assist the wayfarer to find work. Often he is kept till late in the day, instead of being able to do his task at an early hour as quickly as possible and then get off; and the task is managed so as to be burdensome and difficult to the unaccustomed. In fact our system of casual wards is managed in exactly the opposite way to that of a proper system of relief stations.

Labour colonies have to some slight extent been tried in England; a good deal of knowledge may be gained from the experience of foreign countries. In general, labour colonies do not appear to be used by the genuine unemployed—genuine in the sense of being capable workmen temporarily out of work—but to be largely inhabited by tramps and other incompetent people. This seems to indicate that a labour colony to be used in connection with any scheme like that of Mr. Long of last

winter, should only take in thoroughly competent but temporarily distressed workmen. It would be interesting to ascertain how far this policy was in fact carried out.

Enough has been said to show that this report is full of matter of the greatest interest and value. It is an excellent example of the admirable work which the Board of Trade can do.
C.P.S.

The Lancashire Cotton Industry. By Sidney J. Chapman, M.A. vii + 369 pp., 8vo. Manchester: at the University Press, 1904. Price 7s. 6d. net.

It would be impossible to have chosen a more suitable book as the first of the economic series of the publications of the University of Manchester, than a book by the Dean of the Faculty of Commerce upon the Lancashire cotton industry. This great industry has many features of remarkable interest—highly organised labour, a highly developed market, and highly developed machinery. The economist who studies this industry is confronted by a wealth of interesting topics; if he treats them all at length his treatise would become a series of volumes: if he concentrates particular attention on one topic, he is open to the charge of having unduly neglected others. At first reading one is tempted again and again to complain that Professor Chapman has treated some part of his subject too briefly. The mechanician will find that the details of the improvements in machinery are scanty; the student of markets will complain that he wants to know much more about the cotton market and its technicalities than he finds here. [It is something to learn what a “straddle” is; but what about “points on”?] The trade unionist will find that Lancashire unionism is so wonderful an instance of industrial combination that it should have figured even more largely than it does in this book. In fact, it is impossible to read this book without feeling dissatisfied. The reader always wants more, and feels that it is just those details that he particularly wanted to know are left out. A criticism of this kind is always easy to make; the answer, of course, is, that what Professor Chapman in his preface modestly calls “Some notes for an industrial morphology,” cannot be expected to contain everything, and the reader must rest content with what he has.

The treatment of the subject is in the main historical, and the historical method is always liable to tell us but too little of the facts. Unless statistics are given in great profusion, and at the same time are prepared scientifically, the information is liable to be of a rather vague character. If Professor Chapman had given us more statistics, some readers (at any rate members of the Royal Statistical Society) would have been better pleased. Again, the historical method is rather too much frightened of pure theory. A little more theory would have made this book a good deal more illuminating; but the general reader is no doubt bored with statistics and disgusted with theory, so that from some points of view the author has done well to hide up a good deal of excellent reasoning and facts in the guise of a descriptive analysis.

The value of the book is enhanced by a good bibliography ; but would it not be possible in a future edition to indicate the main sources of information as to the cotton industry in other countries ? The student often finds it difficult to know where to find this, and he should be encouraged to make comparative studies where possible.

C.P.S.

The Records of a Scottish Cloth Manufactory at New Mills, Huddingtonshire, 1681-1703. Edited from the Original Manuscripts, with Introduction and Notes, by W. R. Scott, M.A., D.Phil. Litt.D. xci + 366 pp., 8vo. Edinburgh : The University Press, 1905.

The student of economic history may on occasions feel disheartened when he surveys the gigantic area contained within the boundaries by which his investigations are confined. In a sense he is exposed to those great difficulties of selection which arise from an "enbaras des richesses ;" and the possibility that some new discovery may disturb a conception of the facts which previously seemed to be established on a sure foundation must continually be present to his mind, so long at least as so considerable a portion of the ground remains partly or wholly unexplored. The encouraging feature of the situation is the fact that not a few competent economists have been attracted lately to historical research, and that historians have begun to recognise more fully the importance of this particular special section of their general studies. The volume before us affords a welcome illustration of both these gratifying circumstances. For we owe the publication of this interesting and important addition to our knowledge of economic history to the enterprise of the Scottish History Society, and the preparation of these records for the press has been intrusted to the competent and careful handling of the Lecturer on Political Economy at the University of St. Andrews.

As Dr. Scott remarks in his introduction, the papers are, in one respect, unique. They fill, and fill adequately, a gap in our information about the "little things of commerce" in the "daily life" of the seventeenth century. Their interest, too, is not diminished by the human character of the document ; for, as their editor states, the records are something more than bare minutes alone, and throw some curious side-lights on the habits and dispositions of the merchants who are concerned, and on the affairs of their domestic as well as of their business life. The minutes of certain great companies for foreign and colonial trade, such as the East India Company and others, exist wholly or in part, and the records of the Banks of England and of Scotland furnish not a few particulars relating to finance. But the New Mills Company was by contrast with these trading and financial undertakings a manufacturing company, and the greater part of their minutes have been printed in full, covering a period of almost a quarter of a century. Unfortunately the period thus embraced is not continuous, because, while the first document consists of the complete minutes from the foundation of the Company in 1681 to 1691, the second series does not begin before 1701, and ends

in the middle of 1703. But, although it occupies no more than a fourth of the time comprised within the earlier record, it is, Dr. Scott tells us, of the same length. Partly this was due to the development of the business of the Company, and partly it was owing to the circumstance that certain documents, which were only mentioned earlier, were at the later time summarised or reproduced in full. For the purposes of the present volume Dr. Scott was compelled, from exigencies of space, to omit some of the material contained in this later series, and he has for instance printed a selection only from the inventory, now added, of the purchasers of each piece of cloth that had been sold, and of the price which was paid for it. To the minutes he has added two further documents of great interest and of considerable importance. One he describes as a "very early prototype of the modern prospectus," being an estimate of capital required, of working expenses, and of anticipated profits. The other is the original contract of co-partnership, which, he remarks, can fortunately be compared with other similar documents which exist. Yet in not a few respects, he observes, the unique character of the documents here printed prevents the application of the comparative method. The conditions under which the company carried on its business have, as Dr. Scott says, "long since disappeared." In certain matters it "exercised functions" which are now assumed by Government, and it "enjoyed most extensive privileges and immunities from the State." Accordingly, in the successive sections of his introduction, Dr. Scott prepares his readers for the study of the minutes by furnishing them with an account of the cloth trade in Scotland in the seventeenth century, and with an examination of the special influence of the joint-stock company upon the industrial revival which took place in Northern Britain towards the termination of the century. He then sketches in outline the history of the New Mills Cloth Company itself. This preliminary information is, he rightly holds, necessary to the intelligent appreciation of the records; and he has, we think, succeeded in preserving a just mean between the omission or sparse notice of important points and the introduction of irrelevant or superfluous detail. He certainly succeeds in demonstrating the great value of these records as a contribution to economic history; and we venture again in conclusion to offer to him and to the Scottish History Society our congratulations on their publication. L.L.P.

L'Impérialisme Économique et la Grande Industrie Anglaise. Par Paul Gannay. xxi + 324 pp., 8vo. Paris: F. Pichon et Durand-Auzias, 1905.

Fiscal controversialists in this country, we have no doubt, will be greatly interested by this careful study of the question by a foreign observer, who combines an assured conviction of the rightful issue with a discriminating opinion on the merits of the arguments advanced. M. Gannay states in his preface that he has confined himself to the economic problem, and relegated political considerations to the second place, but he nevertheless supplies, in the successive

chapters of the first of the two sections into which his book is divided, a fairly detailed account of the course of the larger campaign conducted by Mr. Chamberlain with the object of establishing colonial preferences, and examines with some fulness the sufficiency of the narrower policy of retaliation against foreign countries announced by Mr. Balfour.

He suggests some novel points of view, or at least contrives to impart a welcome freshness to some aspects of the controversy which have hitherto been overshadowed or inadequately studied. For instance, he regards, whether rightly or wrongly, the adoption by this country in the middle of the nineteenth century of a fiscal policy of free trade, and its full development during the latter half of the century, as a passing phase—a temporary departure from the imperialist tradition which has been a characteristic of our history taken as a whole. He again distinguishes imperialism, not merely from free trade, or free imports, on the one hand, but also on the other from protection, for, he contends, the extravagant exaggerations of protectionists are rejected by imperialists. He indicates two obstacles to the success of the new policy, of which the one is the small number of the white population in the colonies, and the other is the particularist spirit of the colonists. Mutual concessions are accordingly demanded by the situation, and this requirement the policy of preferential tariffs negotiated by means of “give and take” arrangements satisfies. M. Gannay himself feels no doubt about the final decision of English opinion, which, he is sure, will move slowly towards the federation for which commercial union will prepare. He holds that Great Britain is now at the turning point of her history. Like a traveller who, after traversing a fertile country with rapid steps, finds himself confronted by an unknown sea which stops his way, we may now arrest our steps, or we may retreat, or we may advance. M. Gannay believes that of the three alternatives England will chose the last, and, risking everything in order not to fall from power, will try the bold experiment.

Such is his deliberate opinion, and the reader of these interesting chapters must allow that it has not been lightly formed without examination of the facts. For M. Gannay does not, on the other hand, fail to indicate defective reasoning which, he thinks, has been employed by either party in the controversy. Nor does he shut his eyes to the extravagance of the statements which have been sometimes put forward. He fully recognises that the English democracy is not yet convinced; and he avers that no one should be astonished at its hesitation. He remarks that Mr. Chamberlain himself cares little for formal correctness of abstract argument, but speaks throughout as a practical man dealing with matters of hard fact. M. Gannay himself attempts, as we think, with no small success, to expound and justify a theory of “economic imperialism,” but in the second and larger portion of his book he also passes from the abstract to the concrete, and, as imperialism will, he argues, affect especially our great industries, he subjects their present condition and future prospects to review in successive

chapters. His conclusion is expressed summarily in his preface: "As I advance in this great task," he says, "I meet signs and symptoms of commercial decline. It is doubtless relative. It is often only incipient. But it is none the less already very real." Here again, we may observe, M. Gannay does not accept without searching questioning the lax assertions of interested advocates anxious only to make out a case. He investigates independently, and distinguishes between the varying conditions and the contrasted prospects of different industries.

Nor, again, is his opinion formed without consideration of the possible effects on his own country of the adoption by her near neighbour and her large customer of an altered fiscal policy. The influence of the change will probably not be otherwise than prejudicial, in some respects at least, and this consequence M. Gannay clearly sees and openly acknowledges. But he does not allow suggestions of this nature, however disquieting they may or may not be, to disturb his manifest conviction that the change will come; and his attitude on this particular matter is in harmony with the general candour and persistence with which he has conducted his inquiries, and with the definiteness and perspicuity with which throughout he announces his conclusions. Of the instructiveness of his book for English readers, whether they agree or disagree with his opinions, no doubt can, we think, be entertained. Invested with all the charm of the lucidity and grace of the French language, they will here find a plain full statement of the outstanding facts of British trade, and an acute and not unfair review of the opinions of the chief protagonists in the controversy. They will be enabled to observe an English question of the day through French spectacles. "To see ourselves as others see us" sometimes at any rate conduces to more exact and comprehensive views.

L.L.P.

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April—Statistica dei Consorzi universitari italiani: *C. F. Ferraris*. Gli Scioperi italiani nel 1804: *A. Salucci*. Lo sviluppo delle Reiffeisen-Organisationen in Germania: *G. Giliberti-Cosenza*. La Politica commerciale Svizzera ed i recenti Trattati di commercio: *A. O. Olivetti*.

May—Il Dazio doganale sul grano e il consumo del vino: *Francesco Coletti*. Sopravvivenze militari: *V.* Le Infermità e le imperfezioni fisiche quali cause di inabilità al servizio militare nell' armata italiana fra gli iscritti di leva delle classi dall' anno 1875 al 1882: *A. Zerì*. I risultati del Censimento italiano del 1901: *G. Ferroglia*. Mezzo secolo di vita dell' Unione tipografico-editrice torinese.

Rivista Italiana di Sociologia. *January—February*, 1905 — La politica internazionale nelle condizioni sociali presenti: *E. Catellani*. Sulla Storia economica d' Italia nell' alto medio evo: *A. Solmi*. La Storia del diritto medievale e i problemi sociali odierni: *G. Arias*.

INTERNATIONAL—

Bulletin de l'Institut International de Statistique. *Tome six, Livraison 3*—Statistik des Volks- oder Nationaleinkommens und Vermögens (Grösse, Arten, Verteilung), besonders mit Vertwertung der Steuerstatistik: *A. Wagner*. Rapport sur la Contribution

INTERNATIONAL—*Contd.**Bulletin de l'Institut International de Statistique—Contd.*

que peut apporter la Statistique financière à l'étude des Phénomènes sociaux, politiques, économiques et juridiques: *F. Faure*. Ce que c'est que la richesse d'un peuple et comment on peut la mesurer: *A. de Forille*. Evaluation de la fortune privée en France d'après les éléments fiscaux: *Yves Guyot*. Die Schätzung des Volkseinkommens: *F. Fellner*. La population industrielle et les Entreprises en Allemagne, Belgique, France et aux États-Unis d'après les recensements effectués depuis dix ans: *L. March*. Sur les Explorations démographiques à exécuter dans les pays où il n'existe pas encore de recensement et sur l'organisation d'une statistique internationale régulière du mouvement de la population dans tous les pays: *M. Rubin*. Communications sur les Etrangers et les Provinciaux de France résidant à Paris et sur les Etrangers résidant dans les cantons du Nord: *V. de Swarte*. Recherches statistiques sur l'alimentation ouvrière: *E. Harweiler*. Die schematisch-statistischen Karten des Kaiserlichen Statistischen Amtes zu Berlin, mit 3 Karten: *P. Mayel*. Die historische Lohnbewegung von 1300-1900 und ihre Ursachen: *G. Schmoller*. Die deutsche Arbeiterstatistik: *F. Zahn*. Zweck und Methode der historischen Lohnstatistik: *J. Mandello*. La Statistique Internationale des Valeurs Mobilières. V^{me} Rapport: *A. Neymarck*.

V.—*Quarterly List of Additions to the Library.*

Additions to the Library during the Quarter ended 15th June, 1905, arranged alphabetically under the following heads:—(a) Foreign Countries; (b) India and Colonial Possessions; (c) United Kingdom and its Divisions; (d) Authors, &c.; (e) Societies, &c. (British); (f) Periodicals, &c. (British).

The Society has received, during the past quarter, the current numbers—either quarterly, monthly, or weekly—of the periodical official publications dealing with the following subjects:—

Consular Reports—From United States and United Kingdom.

Labour Reports, &c.—From Austria-Hungary, Belgium, France, Germany, Italy, United States, New York State, Canada, New Zealand, and United Kingdom.

Trade Returns—From Argentina, Austria-Hungary, Belgium, Bulgaria, China, Denmark, Egypt, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Roumania, Russia, Spain, Sweden, Switzerland, United States, India, Canada, and United Kingdom.

Vital Statistics—From Argentina, Egypt, Germany, Italy, Netherlands, Roumania, Switzerland, United States (Connecticut and Michigan only), Queensland, South Australia, and United Kingdom.

Vital Statistics of following Towns—Buenos Ayres, Buda-Pesth, Brünn, Prague, Brussels, Copenhagen, Berlin, Bucharest, Moscow, Madrid, London, Manchester, Dublin, Edinburgh, and Aberdeen.

The Society has received during the past quarter the current numbers of the following unofficial Periodicals and Publications of Societies, &c., which are arranged under the Countries in which they are issued:—

Denmark—Nationalökonomisk Tidsskrift.

France—Annales des Sciences Politiques. Économiste Français. Journal des Économistes. Monde Économique. Polybiblion, Parties Littéraire et Technique. Réforme Sociale. Le Rentier. Revue d'Économie Politique. Revue de Statistique. Journal de la Société de Statistique de Paris.

Germany—Allgemeines Statistisches Archiv. Archiv für Sozialwissenschaft und Sozialpolitik. Deutsche Oekonomist. Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirtschaft. Jahrbücher für Nationalökonomie und Statistik. Zeitschrift für die gesamte Staatswissenschaft. Zeitschrift für die gesamte Versicherungs-Wissenschaft. Zeitschrift für Socialwissenschaft. Mittheilungen aus der Handelskammer Frankfurt a. M.

Italy—L'Economista. Giornale degli Economisti. Rivista Italiana di Sociologia. Riforma Sociale. Societa Umanitaria, Bollettino mensile.

Sweden—Ekonomisk Tidsskrift.

Switzerland—Journal de Statistique suisse.

United States—American Journal of Sociology. Banker's Magazine. Bradstreet's. Commercial and Financial Chronicle, with supplements. Journal of Political Economy. Political Science Quarterly. Quarterly Journal of Economics. Yale Review. American Academy of Political and Social Science, Annals. American Economic Association, Publications. American Geographical Society, Bulletin. American Statistical Association, Quarterly Publications. American Philosophical Society, Proceedings and Transactions. Columbia University, Studies in History, &c.

India—Indian Engineering. Asiatic Society of Bengal, Journal and Proceedings.

Canada—The Chronicle: Insurance and Finance.

New Zealand—Government Insurance Recorder. Trade Review and Price Current.

United Kingdom—The Accountant. Accountants' Magazine. Athenæum. Australian Trading World. Bankers' Magazine. Broomhalls' Corn Trade News. Browne's Export List. Colliery Guardian. Commercial World. Economic Journal. Economic Review. Economist. Fireman. Incorporated Accountants' Journal. Insurance Record. Investors' Monthly Manual. Investors' Review. Joint Stock Companies' Journal. Labour Co-partnership. Licensing World. Local Government Journal. Machinery Market. The Market. Nature. Navy League, Journal. Policy-Holder. Post Magazine. Produce Markets' Review. Public Health. Publishers' Circular. Sanitary Record. Shipping World. South American Review. Statist. The Times. Tuberculosis. Anthropological Institute, Journal. Cobden Club, Leaflets. East India Association, Journal. Howard Association, Leaflets, &c. Institute of Actuaries, Journal. Institute of Bankers, Journal. Institution of Civil Engineers, Minutes of Proceedings. Iron and Steel Institute, Journal. Lloyd's Register of British and Foreign Shipping, Statistical Tables. London Chamber of Commerce, Journal. London University Gazette. Manchester Literary and Philosophical Society, Memoirs and Proceedings. Royal Agricultural Society, Journal. Royal Asiatic Society, Journal. Royal Colonial Institute, Proceedings and Journal. Royal

United Kingdom—Contd.

Geographical Society, Geographical Journal. Royal Irish Academy, Proceedings and Transactions. Royal Meteorological Society, Meteorological Record and Quarterly Journal. Royal Society, Proceedings. Royal United Service Institution, Journal. Sanitary Institute, Journal. Society of Arts, Journal. Statistical and Social Inquiry Society of Ireland, Journal. Surveyors' Institution, Professional Notes and Transactions. Trade Circulars.

(a) Foreign Countries.**Argentine Republic—**

Agricultura. Ministerio de. Boletín mensual de Estadística y Comercio. (Current numbers).....	} The Ministry of Agriculture
Ferrocarriles en Explotación. Estadística de los. Tomo 11. Año 1902. Fol. 1903	
<i>Buenos Ayres (Province)—</i>	
Dirección General de Estadística. Boletín mensual. (Current numbers)	} The Provincial Statistical Bureau
Demografía, año 1902. Svo. 1905	
<i>Tucumán.</i> Movimiento de población de la ciudad de Tucumán. Año 1904 & Jan.—Mar., 1905. Cards....	} The Municipal Statistical Bureau

Austria-Hungary—

Ackerbauministeriums. Statistisches Jahrbuch für 1902. Heft 2, Der Bergwerksbetrieb Österreichs im Jahre 1902. Lieferung 4. Löhne und Schichtdauer beim Bergbau. Svo. 1905	} The Ministry of Agriculture
Ackerbauministeriums. Statistisches Jahrbuch für 1903. Heft 2. Der Bergwerksbetrieb Österreichs im Jahre 1903. Lieferung 4. Löhne und Schichtdauer beim Bergbau. Svo. 1905	
<i>Arbeitsstatistisches Amt—</i>	
Die Arbeitervereine in Österreich nach dem Stande vom 31 Dezember, 1900, samt den in diesem Stande bis Ende 1904 vorgefallenen Veränderungen. 1. Band. Tabellarischer Teil. 4to. 1905	} The Austrian Labour Department
Bericht über die Tätigkeit des k.k. Arbeitsstatistischen Amtes während 1904. Svo. 1905.....	
Bleivergiftungen in Hüttenmännischen und gewerblichen Betrieben. Ursachen und Bekämpfung. 1 Teil. Bericht über Erhebungen in Blei- und Zinkhütten. 4to. 1905	
Protokoll der 19 Sitzung des Arbeitsbeirates 1905. Svo. 1905	
Stenographisches Protokoll durchgeführten Vernehmung von Auskunftspersonen über die Arbeitszeit in Banken, Kredit- und Versicherungsanstalten. 4to. 1905	
Stenographisches Protokoll durchgeführten Vernehmung von Auskunftspersonen über die Arbeitszeit in Fabrikniederlagen. 4to. 1905	
Stenographisches Protokoll durchgeführten Vernehmung von Auskunftspersonen über die Arbeitszeit im Speditionsgewerbe. 4to. 1905	
Handel. Statistik des auswärtigen Handels des österr.-ungarischen Zollgebiets im Jahre 1904. Band 2, Specialhandel; Band 3, Vormerkverkehr, Durchfuhr. 2 vols. Svo. 1905	
Mitteilungen des k.k. Finanz-Ministeriums. Jahrgang 11. Heft 1. Svo. 1905	
	} The Ministry of Commerce
	} The Ministry of Finance

(a) Foreign Countries—Contd.

Austria-Hungary—Contd.

Österreichisches Wirtschaftspolitisches Archiv (vormals "Austria"). (Current numbers.) Svo.	The Ministry of Commerce
Betriebszählung, 3. Juni, 1902. Ergebnisse der Gewerblichen. Hefte 5—7. Fol. 1904-05	
Sanitätswesens. Statistik des, für 1901. Fol. 1905	The Central Statistical Commission
Sparkassen. Statistik der, für 1902. Fol. 1905	
Statistisches Jahrbuch der autonomen Landesverwaltung in dem in Reichsrath vertretenen Königreichen und Ländern. Jahrgang 4. La. Svo. 1904	
Statistische Monatschrift. (Current numbers)	
Statistische Nachrichten aus dem Gesamtgebiete der Landwirtschaft. (Current numbers)	
Statistischen Seminars an der Universität Wien im Wintersemester, 1903-04. Bericht über die Tätigkeit des. Svo. 1905	
Unterrichtsanstalten. Statistik der, für 1901-02. Fol. 1905	
Volkszählung, 31 Dec., 1900. Ergebnisse der, Heft 6, (Supplement). Fol. 1905	The Municipal Statistical Bureau
Budapest. Monatshefte des Budapester Communal-Statistischen Bureaus. (Current numbers)	

Belgium—

Chemins de Fer, Postes, Télégraphes, Téléphones et Marine. Compte rendu des opérations pendant l'année 1902. Fol. 1903	Dr. J. Scott Keltie
Mines. Annales des Mines de Belgique. (Current numbers)	The Belgian Labour Department
Hasselt. Exposé de l'administration et de la Situation des Affaires Communales pendant l'exercice 1903-04. Svo. 1905	The Burgomaster
Académie Royale de Belgique. Bulletin de la classe des lettres. . . 1905. (Current numbers)	The Academy

Brazil—

Importação e Exportação. Movimento marítimo, cambial e do Café, em 1903. Fol. 1903	The Statistical Bureau
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Chile—

Sinopsis Estadística i Jeográfica de la Republica. Parte I. La. Svo. 1904	The Central Statistical Bureau
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China—

Customs Gazette. (Current numbers)	Sir Robert Hart, Bart., G.C.M.G.
Native Custom Trade Returns. No. 1. Foochow: Kuang Hsü, 29th year. No. 2. Tientsin, 1902. 2 parts, 4to. 1904	

Cuba—

Boletín del Centro General de Comerciantes e Industriales. Svo. 1904-05	The National Library, Havannah
Centro General de Comerciantes e Industriales. Memoria, Año Social de 1904-05. Svo. 1905	
Memoria de Obras publicas correspondiente al año 1902-03. Plates, Svo. 1904	
Habana. Ayuntamiento de la: Proyecto de Presupuesto de Gastos e Ingresos ordinarios y extraordinarios. Para el año economico de 1904 á 1905. Fol. 1905	

(a) Foreign Countries—Contd.

Denmark—

- Copenhagen.* Borneantal og Borneodelighed i } The Municipal Sta-
København'ske Egteskaber. 63 pp., 8vo. 1905 } tistical Bureau

Egypt—

- Commerce Extérieur de l'Égypte pendant 1904. } The Director-Gene-
La. 8vo. 1905 } ral of Customs
Dette Publique. Compte rendu des travaux de la } The "Caisse de la
Commission de la, pendant 1904. 2 copies, 8vo. } Dette Publique"
1905 }
Egyptian Postal Guide. No. 28, Feb., 1905. 8vo. } The Postal Adminis-
1905 } tration, Cairo

France—

- Agriculture. Ministère de l'. Bulletin mensuel de } The Ministry of
l'Office de Renseignements agricoles. (Current } Agriculture
numbers.) 8vo. }
Budget général de l'Exercice 1904. 15 parts, 4to. 1903.... } Dr. J. Scott Keltie
Commerce et Navigation. Tableau général du, année } The French Govern-
1903. Vol. 2. Navigation. La. fol. 1904..... } ment
Finances. Ministère des. Bulletin de Statistique et } The Ministry of
de Législation comparée. (Current monthly num- } Finance
bers) }
Forêts soumises au Régime forestier, forêts domani- } —
ales communales et d'établissements publics. }
Statistique des, année 1892. 8vo. 1904 }
Travail. Les Associations Professionnelles Ouvrières. } French Labour De-
Tome iv, Industries du Bâtiment-Transports- } partment
Industries diverses. 8vo. 1904 }

Germany—

- Ämtliche Nachrichten des Reichs-Versicherungsamts. } The Bureau
21. Jahrgang. No. 4. 15 April, 1905. 4to. 1905 }
Deutsches Handels-Archiv. Jan.—Dec., 1904. 4to. } Dr. J. Scott Keltie
1904 }
Gesundheitsamtes. Veröffentlichungen des Kaiser- } The Imperial Health
lichen. (Current numbers) } Bureau
Seeschiffahrt im Jahre 1903. Teile 2—4. 4to. 1905 } The Imperial Statis-
Vierteljahrshefte zur Statistik des Deutschen Reichs. } tical Bureau
Jahrgang 1905. Heft 1. 4to. }

Prussia—

- Zeitschrift des K. Preussischen Statistischen } The Royal Prussian
Bureaus. (Current numbers) } Statistical Bureau
Genossenschaftsstatistik. Mitteilungen zur deut- } Dr. A. Petersilie
schen, für 1903. Fol. 1905 }
Statistisches Handbuch für den Preussischen Staat. } Purchased
Band iii. 8vo. 1898..... }

Saxony—

- Statistisches Jahrbuch für das Königreich Sachsen. }
33. Jahrgang, 1905. 8vo. 1905 } The Statistical Bu-
Zeitschrift des K. Sächsischen Statistischen Bureaus. } reau of Saxony
(Current numbers)..... }

Württemberg—

- Statistisches Handbuch. Jahrgang 1902 und 1903. }
La. 8vo. 1904 } Dr. J. Scott Keltie
Württembergische Jahrbücher für Statistik und }
Landeskunde. 1904. Hefte 1 und 2. 4to. }
1904-05 }

(a) Foreign Countries—Contd.

Germany—Contd.*Frankfurt—*

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| Jahresbericht über die Verwaltung des Medizinalwesens, die Krankenanstalten und die Öffentlichen Gesundheitsverhältnisse der Stadt Frankfurt a/M. Jahrgang 1903. Svo. 1904..... | } The Society |
| Tabellarische Übersichten betreffend den Zivilstand der Stadt Frankfurt am Main im Jahre 1904. La. Svo. 1905..... | |
| Archiv für Rassen- und Gesellschafts-Biologie. 2. Jahrgang. Hefte 1 und 2. Jan.—April, 1905. 2 parts, Svo. 1905..... | } The Editor |
| Veröffentlichungen des Deutschen Vereins für Versicherungs-Wissenschaft. Heft 5. Svo. 1905 | |
| | } The Society |

Greece—

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| Commerce de la Grèce avec les Pays Etrangers pendant 1903. 4to. 1905 | } The Bureau of Statistics |
| Commission Financière Internationale. Importation de la Douane du Pirée pendant 1904. Fol. 1905 | |
| | } The Commission |

Italy—

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| Annali d' Agricoltura, 1905. Concimi, Mangimi, Sementi e sostanze antiparassitarie commercio frodi, e repressione delle frodi, specialmente in Italia. Svo. 1905 | } The Director-General of Agriculture |
| Industriale. Statistica. Riassunto delle Notizie sulle condizioni industriali del Regno. Parte 2, Svo. 1905 | |
| Relazione sull' Amministrazione del Demanio e delle Tasse sugli Affari per 1901-02, e 1902-03. 2 vols., fol. 1903-04 | Dr. J. Scott Keltie |
| Tabella indicante i valori delle merci nell' anno 1904 per le statistiche commerciali. Svo. 1905 | } The Director-General of Statistics |
| Società Umanitaria, Milano. Pubblicazione. No. 10. April. Contro la disoccupazione. Le Casse di sussidio ai disoccupati e gli Uffici di collocamento, all' Estero e in Italia. Svo. 1905..... | |
| | } The Society |

Japan—

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| Agriculture and Commerce. Twentieth Statistical Report of the Department of, for 1903 and previous years. La. Svo. 1905 | } The Department |
| Mouvement de la Population pendant l'an 34 de Meiji, 1901. Fol. 1905 | |
| Résumé statistique de l'Empire du Japon, 19 ^e année. Svo. 1905 | } The Bureau of General Statistics |

Mexico—

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| Boletín de Estadística fiscal. (Current monthly numbers, and for the year 1902-03.) Fol. 1905..... | } The Statistical Bureau |
| Estadística fiscal. Datos relativos. (Current numbers) | |

Netherlands—

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| Faillites. Statistique des, dans les Pays-Bas. Année 1903. 4to. 1905 | } The Central Statistical Bureau |
| Finances. Statistique des Impôts et autres Revenus du Royaume pour 1903. 4to. 1905 | |
| Finances. Statistiek der Gemeentelijke en Provinciale financiën in 1902. Svo. 1905 | |
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(a) Foreign Countries—Contd.

Netherlands—Contd.

Grèves et exclusions dans les Pays-Bas pendant 1904.		
8vo. 1905		
Maandcijfers No. 13, Jaar 1904.	8vo. 1905.	The Central Statistical Bureau
Revue du Bureau Central de Statistique, 11 ^e		
Livraison. 8vo. 1905		
Prisons. Statistique pénitentiaire des Pays-Bas pour 1903.	4to. 1905	The Ministry of "Waterstaat," &c.
Zeescheepvaart. Statistiek van de, Jaar 1903.		
La. 8vo. 1905		

Norway—

Journal du Bureau Central de Statistique.	22 ^e	The Bureau
année, 1904.	8vo. 1905	
Norges Officielle Statistik.	8vo. 1905—	
Aliénés. Statistique des hospices d', pour 1903.		
8vo. 1905		
Banques privées par actions. Statistique des, en 1903. (100).	8vo. 1905	The Central Statistical Bureau
Pêches. Grandes pêches maritimes pendant 1903. (101).	8vo. 1904	
Propriétés foncières rurales au 3 Déc., 1900. (102).		
8vo. 1904		
Sanitaire et médical. Rapport sur l'état, pour 1902. (103.)	8vo. 1904	
Télégraphes et Téléphones. Statistique des, 1903-04. (104.)	8vo. 1904	
Travail. Bulletin du Travail du Bureau Central de Statistique.	1 ^e et 2 ^e année, 1903-04.	8vo. 1905

Roumania—

Statistique des Professions soumises à la contribution des Patentes en 1903-04.	4to. 1905	Major. P. G. Craigie, C.B.
Statistique des Successions et des principales transactions soumises aux Droits d'Enregistrement.	8vo. 1905	
Le Mouvement Économique (Roumanie et Péninsule Balkanique). Revue Mensuelle.	Vol. 1, No. 6.	Messrs. P. S. King and Son
8vo. 1905		

Russia—

Diagram-maps showing Prices of Rye and Oats in European Russia on 1st of month. (Current numbers)		The Ministry of Finance
Prices of Grain at Ports. Return of (in Russian). Sheets. (Current numbers)		
Recensement général de la Population, 1897. Fasc. 4, 5, 6, 7.	Sm. 8vo. 1905	His Excellency N. Troinitsky
Règlement définitif du Budget de l'Empire pour 1903. Memoire explicatif . . .	8vo. 1904	
Finland. Assistance publique des Communes de la Finlande en 1901.	8vo. 1905	The Central Statistical Bureau
Moscow—		
Bulletin statistique mensuel de la ville de Moscou. (Current numbers.)	8vo.	The Municipal Statistical Bureau
Bulletin récapitulatif de la ville de Moscou.	Année 1904.	
	8vo. 1905	

Spain—

Estadistica del Impuesto de Transportes por Mar. (Current numbers.)	8vo. 1905	The Director-General of Customs
Memoria sobre el Estado de la Renta de Aduanas en 1904.	8vo. 1905	

(a) **Foreign Countries—Contd.****Sweden—**

Arbetsstatistik. Försäkringsinspektionens underdåniga Berättelse beträffande Försäkringsväsendet, år 1902-03. 8vo. 1904	The University of Upsala
Arbetsstatistik. Meddelanden från K. Kommerskollegii Afdelning för. No. 1. 8vo. 1905	
Arbetsstatistik. Registrerade Sjukkasors verksamhet, år 1901. 8vo. 1905	
<i>Bidrag till Sveriges Officiella Statistik, 1905—</i>	
A. Befolkningsstatistik, 1902. (Population)	The Central Statis- tical Bureau
D. Fabriker och Hantverk, 1903. (Factories)	
G. Fängvården, 1903. (Prisons)	
K. Hälso- och Sjukvården, 1903. (Public Health and Lunacy)	
N. Jordbruk, 1903. (Agriculture)	
P. Undervisningsväsendet, 1901. (Education)	
Q. Statens Domäner, 1903. (Forests)	
U. Kommunernas Fattigvård och Finanser, 1902. (Poor Relief, &c.)	
Y. Sparbanksstatistik, 1903. (Savings banks)	
Y. Sparbanker och Folkbanker, 1903. (Savings banks)	
Rikets In-, och Utforsel. (Current numbers)	
Sammandrag af de enskilda sedelutgifvande bankernas. (Current numbers)	
Sammandrag af Riksbankens Ställning. (Current numbers)	
Statistisk Tidskrift. (Current numbers)	
<i>Stockholm.</i> Berättelse om allmänna hälsotillståndet i Stockholm under året 1903. 1a. 8vo. 1904	

Switzerland—

Annuaire Statistique de la Suisse. 13 ^e année, 1904. 8vo. 1905	The Federal Statisti- cal Bureau
Bétail. Résultats du recensement fédéral du Bétail, 19 avril, 1901. Tome 2. 4to. 1905	

Turkey—

Ottoman Public Debt. Report of the Council of Administration. 21st Financial Year, 1902-03. 8vo. 1903	Dr. J. Scott Keltie
Ottoman Public Debt. Special Report on, for 22nd Financial Year, 1903-04. 8vo. 1904	

United States—

Agriculture. Department of, Crop Reporter. (Current numbers)	The Department Census Bureau—
Special Reports. Mines and Quarries, 1902. 4to. 1905	
[Numbers employed, wages paid, capital invested, quantity and value of products, power and machinery, royalties and rent, &c.]	The Bureau of the Census
Special Reports. Street and Electric Railways, 1902. 4to. 1905	
Commerce and Finance. Monthly Summary. (Current numbers.) 4to. 1905	Department of Com- merce and Labor
Education. Report of the Commissioner of, for 1903. Vol. 1. 8vo. 1905	
Finance. Annual Report of Secretary of Treasury, on State of Finances for fiscal years ended 30th June, 1903 and 1904. 2 vols., 8vo. 1903-05.	Treasury Depart- ment

(a) Foreign Countries—Contd.

United States—Contd.

Debt. Monthly Statements of the Public, and of Cash in Treasury. (Current numbers.) Sheets ...	The Secretary of the Treasury
Gold, Silver, and Notes, &c., in Circulation. Monthly Statements. (Current numbers.) Sheets	
Labor. 10th Special Report of Commissioner of Labor. Labor laws of United States, with decisions of Courts relating thereto. Svo. 1904	The Department of Commerce and Labor
Labor. Eight hours for Laborers on Government Work. Report by the Secretary, Department of Commerce and Labor, on H. R. 4064 (Eight-hour Bill). Svo. 1905	
Labor. Report on Labor disturbances in the State of Colorado, from 1880 to 1904 inclusive, with correspondence relating thereto. Svo. 1905.....	
Mineral Resources of the United States. Calendar Year 1903. Svo. 1904	The U.S. Geological Survey
Minerals. The Stone Industry in 1903. Svo. 1904	
Statistical Abstract of the United States, 1904. 27th Number. Svo. 1905	Bureau of Statistics, Department of Commerce and Labor
Trade. The Foreign Commerce and Navigation of the United States for the year ending 30th June, 1904. Vol. i. 4to. 1904	
Connecticut. 20th Annual Report of Bureau of Labor Statistics for 1903-04. Svo. 1904	The Bureau
Indiana. 10th Biennial Report (16th vol.) of the Indiana Department of Statistics for 1903 and 1904. Svo. 1904	
Maryland. Bureau of Statistics and Information. 13th Annual Report, 1904. Svo. 1905	The Bureau
[Sweat shop and factory inspection. Cost of living. Agriculture. Maryland coal report Immigration. Census of Negroes in Baltimore.]	
Massachusetts—	
35th Annual Report of the Bureau of Statistics of Labor. March, 1905. Svo. 1905	"
[Actual weekly earnings. The causes of high prices. Labor and industrial chronology.]	
Labour. 19th Annual Report of State Board of Conciliation and Arbitration for 1904. Svo. 1905	The Board
Minnesota. 9th Biennial Report of the Bureau of Labor, 1903-04. Vols. 1 and 2. Svo. 1904	
Nebraska. Resources of, Bulletin of the State Bureau of Labor and Industrial Statistics. No. 4. October, 1904. Svo. 1904	"
New York (State)—	
21st Annual Report of the Bureau of Labor Statistics, for year ended 30th September, 1903. Svo. 1904	"
18th Annual Report on Factory Inspection for year ending 30th September, 1903. Svo. 1904	
Ohio. 28th Annual Report of Bureau of Labor Statistics for 1904. Svo. 1905	"
[Manufactures; capital invested, numbers employed, wages paid, values of goods produced. Coal mining. Free public employment offices.]	
Boston—	
Monthly Bulletin of the Statistics Department. (Current numbers)	The Municipal Statistical Bureau
The Municipal Register for 1904. Svo. 1904.....	
Chicago. John Crerar Library. Tenth Annual Report for 1904. Svo. 1905	The Library
New York (City). Public Library. Bulletin. (Current numbers.) Svo. 1905	

(a) Foreign Countries—Contd.

United States—Contd.

Philippine Islands—

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| Census, 1903. Vol. 1, Geography, History, and Population. Vol. 2, Population. Vol. 3, Mortality, Defective Classes, Education, Families, and Dwellings. Vol. 4, Agriculture, Social and Industrial Statistics. 4 vols., 8vo. 1905 | The Bureau of
Census |
| Third Special Report of Collector of Customs for 1903-04. 8vo. 1904 | |

Dr. J. Scott Keltie

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JOURNAL OF THE ROYAL STATISTICAL SOCIETY.

SEPTEMBER, 1905.

*The EFFECT, as shown by STATISTICS, of BRITISH STATUTORY
REGULATIONS directed to the IMPROVEMENT of the HYGIENIC
CONDITIONS of INDUSTRIAL OCCUPATIONS.*

By LEONARD WARD, *H.M. Inspector of Factories.*

(HOWARD MEDAL PRIZE ESSAY.)

[Read before the Royal Statistical Society, 16th May, 1905.

SIR FRANCIS SHARP POWELL, Bart., M.P., President, in the Chair.]

Non est vivere, sed valere vita.

UNTIL the latter end of the eighteenth century many industries were carried on in this country in the homes of the workers, or in comparatively small workplaces adjacent to the dwellings of the operatives. The “producing power” of the workers under this domestic system of employment was, however, quite inadequate to meet the demands of the new industrial era, and the factory system commenced to displace—more rapidly in some branches of industry than in others—the old system. It soon became apparent that the new order was not an unmixed blessing, and the abuses, particularly of child labour, which were concurrent with it, roused the sympathies of the people and attracted the attention of the Legislature. At that time, however, interference with the sanitary conditions of employment on the part of the State was without precedent, but it was conclusively proved that individual action on the part of the more humane employers, and pressure from local authorities, failed to ameliorate to an appreciable extent the conditions under which these youthful labourers were employed. In these circumstances the State was compelled to embark in a new sphere of activity, and the first British statute¹ directed to the improvement of the hygienic conditions of industrial occupations received the Royal Assent on 22nd June, 1802. As the various industries have developed, the policy of State interference has been gradually

¹ 42 Geo. III, c. 73.

extended, until at the present time few productive occupations exist which are not to some extent subjected to protective enactments.

In the following pages an attempt has been made to trace the effect of these enactments so far as some of the more important industries are concerned. It may be convenient here to explain the method of procedure. The subject readily lends itself to division into two distinct groups—the Factory Acts (including parts of the Public Health Acts), and Mines Regulations. Taking each group separately, the Acts are followed in chronological order: and with a view to minimising the repetition which is inseparable from this method, similar industries are classed together wherever such a course appeared to be permissible. The conditions obtaining in each industry prior to and during the period of development of legislation for that section are briefly sketched. This affords a “series of conditions,” from which may be viewed the effect of the regulations directed to that industry. In the limits of this paper it would of course be impossible to discuss the whole effect which could be attributed to these legislative enactments, consequently I have principally confined my attention to the effect under three different, but in some measure closely related, aspects: namely, the effect on (*a*) the mortality rates, (*b*) the sickness experience, and (*c*) the physique of the operatives employed in the several occupations under review. As the Factory Acts came into force many years before the mining regulations, those Acts are reviewed first.

The Factory Acts. Textile Manufactures.

With the successive inventions of Hargreaves’ spinning jenny, Arkwright’s spinning throstle, and Crompton’s spinning mule, an irresistible development of the cotton trade was proceeding, and as steam had not yet been utilised for motive purposes, water power was naturally resorted to: consequently the cotton factories—called cotton mills even to the present day—were built near suitable water-courses, the principal seat being Lancashire. It was soon found that children were capable of performing many of the simpler operations connected with the machines, and as the mills were often built in thinly-populated districts, the local supply of children did not meet the demand. To meet this difficulty large numbers of children and young persons were recruited, under the cloak of apprenticeship, from the workhouses of the metropolis and the large towns, and abuses of the most revolting character were soon brought to light, which ultimately resulted in the passing of the first measure of industrial preventive legislation.

Manchester and the surrounding neighbourhood was the centre of the industry about this period, and some idea of the rapid

development which took place may be gathered from a glance at the following figures:—

Amount of Raw Cotton Imported.

Year.	Amount in lbs.	Year.	Amount in lbs.
1701	1,985,000*	1790	30,574,374‡
'80.....	6,700,000*	1816	94,140,330‡
'87.....	22,600,000†		

* "Official Manual for the City of Manchester," 1880.

† "Beauties of England and Wales." By John Britton. Vol. ix. p. 274.

‡ "Philosophy of Manufactures." By Dr. Ure. 1861, p. 468.

The inevitable result of the overcrowding and general neglect of sanitary precautions which existed was that the condition of the people employed in the cotton mills and those who were connected with them, became so serious as to endanger the general health of the district. To meet the difficulty the county magistrates of Lancaster, in 1784, requested Dr. Percival (a prominent leader of the sanitary reform movement of that period) and several other medical officers to make an inquiry with a view to ascertaining what remedial measures were called for. After careful investigation the medical officers reported,² and they suggested radical changes in the sanitary condition of the work-places and work-people. These suggestions the magistrates caused to be circulated among the mill owners.³

By the removal of Arkwright's monopoly in connection with the spinning frame, the manufacture of cotton goods increased even more rapidly than it had done in the past, and the evils already brought to light appear to have increased rather than diminished; in fact, the more liberal manufacturers themselves became alarmed, and they instituted a Board of Health, whose report,⁴ dated 1796, bears out what was said by the medical officers in 1784.

Notwithstanding these repeated unfavourable reports, and the agitation which was going on, the Central Government allowed another six years to elapse before the Bill of 1802 was introduced. This measure appears to have passed through both Houses without opposition, although it involved the adoption of an entirely new policy, which fact may be considered as indisputable evidence of the unfavourable conditions then prevailing in the cotton mills. The application of this Act was limited to cotton and woollen mills

² "Memoirs of the Literary and Philosophical Society of Manchester," 1784, p. 50.

³ "Report on Parish Apprentices," 1815.

⁴ Fielden's "Curse of the Factory System," 1836.

(the term woollen apparently referred to cotton wool, not animal wool), and its chief aim was the amelioration of the conditions of the apprentice operatives. The sanitary clauses were in substantial agreement with the suggestions of Dr. Percival's committee.

This Act, although of such limited application, should have materially benefited the youthful operatives concerned, but the evidence seems to show that the measure was practically inoperative. In any case, there was abundant evidence to show that further legislation was necessary, for, since the recent application of Watts's steam engine for driving purposes, the owners were not now dependent on the water courses, but were enabled to build their mills in more populous places; and the employment of parish apprentices was no longer necessary, for children of the poorer classes could readily be obtained to meet all their requirements. To meet the altered circumstances, Sir Robert Peel (the elder) brought in a Bill, in 1815, the main theme of which was the limitation of the hours of labour of *all* children, whether apprentices or not. The matter was referred to a Committee of the House of Commons, who reported in the following year (1816).⁵ The evidence put in by Sir Robert Peel fitly describes the conditions which he sought to remedy: "Such indiscriminate and unlimited employment of the poor, consisting of a great proportion of the inhabitants of the trading districts, will be attended with effects to the rising generation so serious and alarming, that I cannot contemplate them without dismay; and thus that great effort of British ingenuity, whereby the machinery of our manufacturers has been brought to such perfection, instead of being a blessing to the nation, will be converted into the bitterest curse."

The adverse criticisms of the Report of the Committee, and the Debates⁶ on the Bill during 1818, show that strenuous efforts were necessary on the part of the reformers, if they were to carry the measure. Despite all the opposition that had been offered, the Bill became law in 1819. This Act applied only to mills for the preparation of cotton, and its sanitary clauses were similar to those of the Act of 1802.

The debates in Parliament on the Bill of 1825, the evidence given before the House of Commons' Committee of 1831-32, and the Report⁷ of the Factory Commissioners of 1833, conclusively prove that the effects of the early Factory Acts were minimised owing to the absence of administrative authority. The hours of labour

⁵ "Report of a Select Committee of the House of Commons on the 'Employment of Children,' 1816.

⁶ "Hansard," 27th April, 1818.

⁷ Factory Commission, 1833.

seem to have undergone some diminution, and to have been made more regular, but it appears that attention to the improvement of the hygienic conditions of employment was exceptional.

Further proof of the almost negligible effect of these primitive Factory Acts may be gathered from the debates on the Bill of 1833. Even the objectors to the measure did not attempt to prove that the law had been enforced.

It should be observed that, so far, the various enactments had been limited to cotton mills only. The Act of 1833, however, applied to all cotton, woollen, worsted, hemp, flax, tow, linen, or silk mills. In considering the application of the Factory Acts to these manufactures I have thought it advisable to review these trades generally as one industry (*i.e.*, the textile industry), and afterwards, without attempting strict observance of sequence, to make separate investigations into some of those branches which have been the subject of special treatment, *e.g.*, humid textile factories, flax mills, and linen factories, and woolcombing and woolsorting processes.

The Act of 1833 was a great advance on all previous Acts, it instituted the medical examination of children prior to employment in a factory, and required each child under 12 years of age to be certified by "some surgeon or physician" "to be of the ordinary strength and appearance of a child of the age of 9 years." Further, it provided the means of efficient administration by the appointment of Inspectors with judicial powers who "shall carry into effect the powers, authorities, and provisions of the present Act."

Although the provisions of the early Factory Acts were not generally observed, yet it may reasonably be assumed that many manufacturers had paid some attention to the hygienic conditions under which the manufacturing processes were carried on, and that the workers experienced, to some extent, the benefits which the promoters of the Acts had endeavoured to obtain by statutory obligation. It must be admitted that if the conditions of employment which Dr. Percival found to exist in 1794 had not been changed for the better, the physical deterioration of the cotton operatives after a period of forty years would have been patent. The result of the investigation carried out by Mr. Samuel Stanway for the Commissioners of 1833 (see page 461) may be taken to show that no substantial deterioration had taken place.

The passing of the Act of 1833, however, did not satisfy the factory reformers, and they continued their efforts, which resulted, in 1840, in the appointment of a Select Committee of the House Commons to inquire into and report on the grievances complained of. The principal subject under consideration by this Committee

was the reduction of the hours of labour, and in the Act (7 Vict., cap. 15) which followed, the half-time or relay system was introduced. Under this Act, which applied only to textile manufactures, the employment in factories of adult females was first regulated (the Mines Regulation Act of 1842 had already prohibited the employment of females underground in mines). The medical examination of workers under 16 years of age was now to be undertaken by specially appointed "certifying surgeons." Here also appears the initial steps in special provisions for the protection of health (as distinct from general sanitary requirements in the factory). The following extract from a report⁸ dated January, 1840, by Mr. L. Horner, one of the Factory Inspectors, conveys the idea of the general attitude, at that period, concerning factory hygiene:—

"The air, in many mills, is in a very offensive state, by reason "of the poisonous smells from badly-constructed closets in the "workrooms, and from a want of proper ventilation." From the present-day point of view it is almost incredible that after the passing of the Act of 1844 no additions were made to the sanitary clauses of the Factory Acts for a period of twenty years. The Privy Council had, in accordance with the provisions of the Public Health Act, 1858, made exhaustive inquiries into the causes, distribution, and preventability of certain diseases which were shown by the Reports of the Registrar-General to produce excessive mortality in different districts of England. The reports of the medical investigators clearly show the intimate connection which exists between public health and local industrial occupations. Dr. John Simon, in his commentary on the report⁹ of Dr. Headlam Greenhow, calls particular attention to this relationship.

I have already noted that previous investigators, with a view to minimising the ill effects of employment in the factories, had invariably pressed for reduction in the hours of labour, but the reports of the Medical Officer of the Privy Council, and, in fact, of the majority of subsequent reports on the question of factory employment, are remarkable in that the importance of hygienic reform is the predominating feature. It would have been difficult to have found a better advocate for the cause than Dr. Simon; in his concluding remarks¹⁰ he says: "Every year now adds to the "relative growth of our town populations; every year increase "the development of our manufacturing system; and there can be "no well-wisher to the country but must rejoice in what is great "and good in those wonderful manifestations of our national life.

⁸ "Inspector of Factories' Report," 18th January, 1840, p. 11.

⁹ "Papers Relating to the Sanitary State of the People of England, p. xxiii."

¹⁰ *Ibid.*, p. xlv.

"But surely it is needful to consider whether the advantages of our social progress must have with them such evils as I have described . . . ; whether the manufacturing greatness of England be not compatible with better sanitary care for the lives of the employed, and with less enormous entail of infantile disease."

I have purposely referred at some length to these invaluable reports of the investigations carried out between 1835-60, because they so lucidly show the intimate connection between public health and the health conditions of industrial occupations, and that any considerations as to the effect of legislative enactments directed to improvement in either, or both, of these directions would be at once unreliable and misleading, unless we have a clear conception of the influences in operation. Further, these reports may be regarded as the precursors of a new epoch in matters relating to both public and industrial hygiene. Already the initial steps in the great sanitary reform movement of this period had been taken: the Public Health Act of 1848 empowered Local Boards of Health to require the owner or occupier of any house used as a factory, in which twenty or more persons of both sexes were employed, "to construct a sufficient number of water closets or privies for the separate use of each sex." Then followed the Factory Act, 1864, which contained specific sanitary measures. Here is introduced the system of "special rules," and the result of expert investigations and advice are apparent in the clause which provides that "every factory to which this Act applies" be ventilated "so as to render harmless, so far as is practicable, any gases, dust, or other impurities generated in the process of manufacture that may be injurious to health."

Two years later the Sanitary Act was passed, and here again local authorities were given powers to require the abatement of nuisances in factories or bakehouses which were "dangerous or prejudicial to the health of those employed therein." Here is first introduced the idea of sufficient cubical space per person, but no standard is laid down. I have failed to trace any concerted action on the part of local authorities with a view to enforcing the sanitary clauses of the Act in factories or workshops. Similar sanitary clauses were embodied in the Public Health Act, 1875, and in the consolidating Factory Act of 1878, thus creating a dual responsibility in the matter. Under the latter Act the meaning of the expression "textile factory" was considerably extended.

For some years an increasing agitation had been going on in the cotton district against the practice of "heavy sizing" and steaming. In addition, the agitation for a nine-hour day was causing unrest.

In 1872 Dr. Bridges and Mr. T. Holmes were requested by the Local Government Board to inquire into the matters of complaint, which were:—

“ That the health of the cotton operatives suffered (*a*) from high temperature, (*b*) from want of ventilation, (*c*) from dust, (*d*) from badly arranged privies, and (*e*) in the weaving department from the effects of over-sized yarn.”

Their report¹¹ contains much valuable information bearing on the sanitary state of the textile factories at that period. It clearly shows that since 1833 improvement had taken place in many departments, although such advance was by no means general. As to carding rooms they say: “We must observe, however, that the use of fans in carding rooms, so far from being universal or generally employed, is, on the contrary, quite exceptional.” As to spinning they say: “The heat of the spinning room we found higher than that of the card rooms, and the ventilation even worse.” . . . “In most of the spinning rooms there are one or more privies, usually of very rude construction, and almost always opening directly into the room.” . . . “With regard to the atmosphere of the throstle room, our language must be nearly the same as in the case of the mule room.”

No immediate remedial steps were taken on the report of Dr. Bridges and Mr. Holmes, but the Cotton Cloth Factories Act, 1889, embodied measures which were calculated to ameliorate the unfavourable conditions of employment to which reference had been made in the report. The clauses of this Act I have considered in conjunction with those of the Act of 1897, which follows later in this section.

The Factory Act of 1891 developed the machinery for dealing with dangerous and injurious trades. Here power was given to the Secretary of State to make “special rules” as to dangerous and unhealthy incidents of employment. Here also the employment of women within four weeks after child-birth was first prohibited.

At this period great activity prevailed in the investigation of the conditions of industrial employment. The Royal Commission on Labour, the reports of which are probably the most exhaustive of their kind ever issued, were prosecuting their inquiries with wonderful precision and vigour; and Home Office Departmental Committees were reporting on various dangerous occupations, and suggesting hygienic measures with unprecedented detail, with a

¹¹ “Report on Proposed Changes in the Hours and Ages of Employment in Textile Factories,” 1873.

view to rendering the several industries concerned less harmful to the persons employed. The Act of 1895 which followed contained several important sanitary clauses. It fixed a minimum air space per person employed—250 cubic feet during the ordinary hours of employment, and 400 cubic feet during overtime. It also embodied special regulations as to the hygienic conditions of laundries, which were now brought under the operation of the Factory Acts. Here special provision was made for the control of tenement factories. Medical practitioners were, by this Act, required to notify certain forms of poisoning and anthrax to the Chief Inspector of Factories. In places “where lead, arsenic, or any other poisonous substance is “used,” the occupier was required to provide suitable washing conveniences for the use of the persons employed. Further, it required “adequate measures” for “maintaining a reasonable “temperature in each room in which any person is employed.”

The Cotton Cloth Factories Act of 1889, previously referred to, was the first attempt to adopt a “standard of ventilation,” viz., 600 cubic feet of fresh air per hour per person employed: in addition, the amount of moisture in each weaving shed was to be kept within certain limits, as specified in the schedule to the Act.

Numerous complaints were made by the operatives as to the injurious effects on health from employment in humid sheds, and in March, 1896, the Secretary of State appointed a small committee of experts “to inquire into the working of the Cotton Cloth “Factories Act, 1889, and into the question of steaming and the “introduction of artificial moisture in cotton weaving sheds, and “to report what amendments in the law, if any, are desirable.”

As regards health conditions the Committee found “that whilst “there is not sufficient evidence to prove that the weavers in the “humidified sheds are more unhealthy than other cotton operatives, “yet they are satisfied that there is foundation for the complaints “made before them of lassitude and malaise.”

“Where it appeared that a deterioration of health had followed “the introduction of artificial humidity, your Committee were “convinced that this was due to other causes than the mere “dampness of the air, such as impurities in the steam infused, “defective ventilation, excessive heat, &c.”

The Committee suggested certain improvements in the conditions of employment, and to give effect to these recommendations the Cotton Cloth Factories Act of 1897 was passed. In February, 1898, the Secretary of State made an Order under it, the most important clauses being those which provided for a chemical test of the purity of the air of humid factories: “in no part “of the cotton cloth factory shall the proportion of carbonic

“acid (carbon dioxide) in the air be greater than nine volumes “of carbonic acid to every ten thousand volumes of air.” The provisions of this Act are now embodied in the Act of 1901, but the “standard of purity” applies only to factories where humidity is produced by artificial means.

Finally, the consolidating and amending Act of 1901 is reached, but as this measure is of such recent introduction, I have not thought it necessary to review its “field of influence.”

Having now surveyed the progress of the hygienic sections of the Factory and correlative Acts, with particular attention to the textile industry as a whole, I proceed to consider the effect of those enactments.

Mortality of Textile Operatives.

“I tremble to think what this country would have been but for the “Factory Acts.”—ARNOLD TOYNBEE.

In considering the subject of the mortality of persons engaged in different occupations, one turns naturally to the invaluable reports issued from the offices of the Registrars-General, but for the existence of which the task of the individual investigator would be impossible. Hence I have fully availed myself of these reports, particularly the decennial supplements of the English reports. Notwithstanding the mass of information they contain, however, the want of more detailed information is experienced when one proceeds to examine the mortality of any particular industry. Further, there is the additional difficulty of local influences, which play such an important part in vital statistics, as was conclusively proved by the facts brought to light by the memorable investigations carried out by Dr. Headlam Greenbow.

Owing to the limited space at my disposal I propose, in this section, to confine my attention principally to the cotton industry.

The occupational mortality table which Dr. Farr inserted in the Registrar-General's twenty-fifth Annual Report shows that the annual mortality per cent. of males, of 15 years of age and upwards, employed in the “wool, cotton, flax, and silk manufactures,” was only slightly in excess of all males aged 15 years and upwards at all age periods from 15 to 55, but over 55 years it was considerably above the larger group. In his next decennial review he said, “the wool, silk, cotton, manufacturing population no longer “experience an exceptionally high mortality. Lord Shaftesbury “and his enlightened colleagues must be gratified, if not entirely “satisfied, with the success that has crowned their life-long labours. “And it is creditable to the millowners to find the men and boys “in their employ suffering less than many other people in towns.”

Evidently Dr. Farr was satisfied that the diminished mortality was largely due to the operation of the Factory Acts.

After the lapse of another decade Dr. Ogle's report on textile manufactures was less favourable: "Among the textile industries " there are two in which the death-rates are high, and, unfortunately, " these are the two in which by far the largest number of persons " are engaged, namely, the cotton industry of Lancashire, and the " woollen and worsted industries of the West Riding." ¹²

Later he says, "the deleterious effect of dust upon the air- " passages is increased, both in the cotton and in the wool factories, " and especially in the former, by the high temperature in which the " work is carried on, and it is impossible to say how much of the " lung mortality is due to the latter cause, and how much to the " dust." ¹³ How far this increase was due to the changes which had been taking place in the methods of manufacture, or to what extent it was due to other causes, it is impossible to say, but it will be remembered that in the joint report of Dr. Bridges and Mr. Holmes, issued in 1873, "the existence of specially unfavourable " conditions in two manufactures . . . namely, the cotton and the " flax manufactures," was clearly indicated. From the death-rates quoted by Dr. Ogle (see table below) it appears that the increase was more marked in the later years of life.

Occupations.	Year.	Ages.			
		15.	25.	35.	45.
All men aged 15 years and upwards {	1860-61	0.721	0.913	1.228	1.767
Persons engaged in the wool, cotton, flax, and silk manufactures, including weavers, not otherwise described..... }	1871	0.772	1.111	1.448	2.005
	1860-61	0.747	0.910	1.203	1.855
	1871	0.642	0.971	1.081	1.856

Occupations.	Year.	Ages.			
		55.	65.	75.	85.
All men aged 15 years and upwards {	1860-61	3.110	6.625	14.882	31.702
Persons engaged in the wool, cotton, flax, and silk manufactures, including weavers, not otherwise described..... }	1871	3.401	6.764	16.345	—
	1860-61	3.690	8.760	20.447	12.857
	1871	3.792	8.166	23.498	—

¹² "Forty-fifth Annual Report of the Registrar-General," 1885, p. xliii.

¹³ "Supplement to the Fifty-fifth Annual Report of the Registrar-General," 1897.

Having in view all the evidence, medical and otherwise, which had been put forward from time to time concerning the harmful effects of employment in textile factories, it seems reasonable to infer that, but for the statutory preventive measures which had been administered since 1833, there would have been a greater difference in the death-rates of the above groups. Dr. Ogle, however, pointed out that much caution must be used in drawing inferences from uncorrected death-rates, although, after due allowance for defects, they may be "accepted as betokening real and substantial " differences of healthiness."

The investigations of Dr. Farr and Dr. Ogle relating to the mortality of males engaged in different industries, has been continued and considerably extended by the efforts of Dr. Tatham, whose report¹⁴ appears to be more favourable to textile workers, as a whole, than that of his immediate predecessor, so far as that inference is permissible from a comparison of the mean annual death-rates at the different age-periods.

But on taking the cotton, flax, and linen manufacture separately the report is less favourable. Dr. Tatham says: "At ages below " 45 years the mortality of cotton operatives scarcely differs " from the average among textile workers, but at each group of " ages above 45 the rates are considerably in excess of that " average. Cotton operatives die half as fast again as the standard " from diseases of the respiratory system. The mortality of " Lancashire cotton operatives from *all* causes has increased " considerably since the previous record; the excess, however, is " entirely limited to ages over 45 years, at which ages the death- " rate has increased by nearly one-fifth." These remarks apply to the whole class, no comparison is made between the workers engaged in the several processes, although it is well known that some departments are much more injurious than others. If the death-rates for particular classes of cotton operatives had been calculated, substantial differences would probably have appeared.

It should be remembered that since 1872 an agitation had been proceeding concerning the ventilation of cotton weaving sheds, and it may reasonably be assumed that many manufacturers had anticipated the requirements of the Act of 1889. Further, the humidity permitted by that Act was stated by Mr. Osborn, the Inspector whose duty it was to administer the Cotton Cloth Factories Act, to be¹⁵ "based on what is necessary for a fairly " 'weavable' atmosphere for any class of cloth, and to this estimate

¹⁴ "Supplement to the Fifty-fifth Annual Report of the Registrar-General," 1897.

¹⁵ "Annual Report of Chief Inspector of Factories," 1901, p. 7.

“is added a ‘playing’ margin; hence no one can reasonably
 “complain of being dealt with if he exceeds the scale. And in this
 “relation, it may be stated, that the majority of capable managers
 “aver that they get their best weaving at about $1\frac{1}{2}^{\circ}$, 2° , or $2\frac{1}{2}^{\circ}$
 “below the humidity they may *legally* attain.”

In this connection the inquirers of 1873 reported:¹⁶ “We must
 “observe that the largest and best mills are free from the reproach
 “of excessive sizing. In them the atmosphere is free from dust or
 “from moisture, and in few of the weaving sheds, either small or
 “great, did we find any high temperature. . . . The appearance
 “of the workpeople in the weaving sheds was healthier and more
 “vigorous than in the card room and spinning room. . . .”
 Summing up their report on the cotton district they said,¹⁷ “The
 “spinning and carding appear to us to have, either from high
 “temperature or from dust, or from both combined, a debilitating
 “tendency . . . “The operations of . . . warping and
 “weaving have in themselves no such tendency.” In the same
 strain is the joint report of Mr. Bridges and Mr. Osborn, written in
 1884:¹⁸ “We have however been able to compare accurately
 “. . . “the mortality among 7,489 male weavers with that
 “among 6,466 cotton operatives of other classes . . . So far
 “as the investigation goes, it appears to show that the health of
 “the weaving population is about on a par with that of the rest of
 “the factory population.” They append the following table, which
 was calculated on the deaths in 1875 to 1882 (both inclusive) and
 the Census of 1881.

*Comparative Mortality of Cotton Weavers and of other Cotton Operatives
 (Males) at various Ages.**

	Age-Periods.						
	10—15.	15—20.	20—25.	25—35.	35—45.	45—55.	55—65.
Mortality per 1,000 (males)—							
Cotton weavers	2·9	5·1	7·8	9·5	15·2	24·1	25·9
Other cotton operatives	3·5	6·3	7·7	9·6	15·1	23·6	64·3

* “Report on the Effects of Heavy Sizing in Cotton Weaving,” C-3861,
 1884, p. 13.

¹⁶ “Dr. Bridges and Mr. Holmes’ Report,” 1873, p. 26.

¹⁷ *Ibid.*, p. 21.

¹⁸ “Report on the effects of Heavy Sizing in Cotton Weaving,” C-3861,
 1884, p. 11.

Accepting their conclusion, and assuming that the agitation which led up to the Act of 1889 was accompanied by greater attention to the hygienic conditions obtaining in the weaving sheds, it would seem that Dr. Tatham's statements would have been modified had the death-rate of weavers only been abstracted. But since the majority of weavers are females, the effect of the improved conditions would be more apparent were the mortality of females also taken into account.

The following figures¹⁹ show that rather more than one half of the textile operatives in the United Kingdom are engaged in cotton factories: further, over 94 per cent. of cotton operatives find employment in the county of Lancaster.

	Number of Persons Employed in 1898-99 in	
	Textile Factories.	Cotton Factories.
United Kingdom	1,036,570	526,107
Lancashire	—	498,090

The Census Return for 1901 shows that in some boroughs textile workers comprise about 30 per cent. of the total inhabitants. With such a relatively large proportion of the inhabitants of a district engaged in one particular branch of industry any marked unhealthiness of occupation may generally be observed, more or less distinctly (much of course depending on the age distribution) in the general mortality. Hence the health statistics of certain towns in Lancashire may be considered as approximately representing the health of cotton operatives generally. For the purpose of this investigation I have dealt with the county boroughs of Blackburn, Burnley, Bolton, and Oldham, each of which has its own special and distinctive features. In Blackburn in 1891 there were 59,659 persons between 15 and 65 years of age, of this number upwards of 18,000, or "almost 32 per cent.," were weavers, "nearly all of whom "worked in humidified sheds."²⁰ Hence any marked improvement in the purity of the atmosphere of the factories in Blackburn should result in a decrease in the death-rates of the workers from phthisis and respiratory diseases. Burnley is also a weaving centre. Mr. Holmes in his evidence before the Royal Commission on Labour stated²¹ that the mills here are fairly well ventilated, many of them having been rebuilt since about 1870. Bolton is a typical cotton

¹⁹ "Supplement to Annual Report of Chief Inspector of Factories," 1900, p. 7.

²⁰ "Roscoe's Committee," 1897, App., p. 117.

²¹ "Royal Commission on Labour, Minutes of Evidence," vol. i, Group C & F

town; the census return for 1901 shows that about equal numbers of persons are employed in the several processes, whereas in Oldham County Borough the great majority of the cotton operatives are employed in preparing, carding, and spinning. Having settled on the districts, I then calculated the death-rates²² from respiratory diseases and phthisis combined, of all persons between the ages of 15 and 65 years, for the four decennials 1851-60, 1861-70, 1871-80, 1881-90, in each of the county boroughs named. In the case of Blackburn I have been able to add the figures for the year 1903.²³ For the sake of comparison I have also calculated the corresponding rates for England and Wales, and for Rutlandshire, the latter representing a healthy county. In addition I have calculated the phthisis-rates for the same periods and groups. The results appear in the following tables:—

Average Annual Death-Rate, per 1,000, from Phthisis and Respiratory Diseases, of all Persons between 15 and 65 years of age, in England and Wales and certain Districts, calculated for each decennial 1851-60, 1861-70, 1871-80, and 1881-90.

	1851-60.	1861-70.	1871-80.	1881-90.	1903.
England and Wales ..	5.23	5.26	4.95	4.30	—
Rutlandshire	4.14	4.15	3.47	2.76	—
Blackburn	6.37	6.37	6.06	5.72	3.34
Burnley	5.83	5.69	4.95	4.60	—
Bolton	6.35	7.00	6.22	5.58	—
Oldham	6.04	6.18	6.39	6.27	—

Average Annual Death-Rate, per 1,000, from Phthisis, of all Persons between 15 and 65 years of age, in England and Wales and certain Districts, calculated for each decennial 1851-60, 1861-70, 1871-80, 1881-90.

	1851-60.	1861-70.	1871-80.	1881-90.	1903.
England and Wales....	3.76	3.60	3.12	2.53	—
Rutlandshire	3.14	2.96	2.22	1.77	—
Blackburn	4.51	3.92	3.10	2.27	1.28*
Burnley	4.32	4.13	2.77	2.12	—
Bolton	4.14	3.88	3.04	2.45	—
Oldham.....	4.25	3.85	3.45	3.11	—

* These figures are calculated from the "Report of the Medical Officer of Health for Blackburn," 1903.

²² "Decennial Supplements to Reports of Registrar-General, 1851-90."

²³ "Annual Report of the Medical Officer of Health for the County Borough of Blackburn."

The following curves express the same facts :—

Chart A :—

- Curve (a) Death-rate from phthisis and respiratory diseases, England and Wales (age 15—65).
 „ (b) Death-rate from phthisis and respiratory diseases, Rutlandshire (age 15—65).
 „ (c) Death-rate from phthisis and respiratory diseases, Blackburn (age 15—65).
 „ (d) Death-rate from phthisis and respiratory diseases, Blackburn (all ages).

Chart B :—

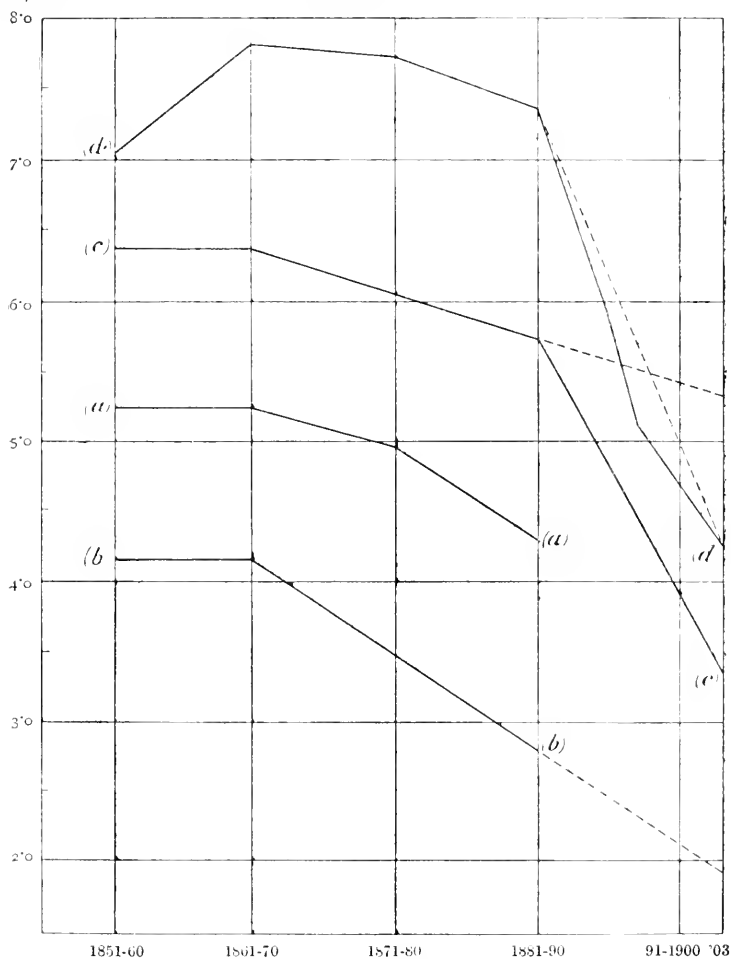
- Curve (a) Death-rate from phthisis, England and Wales (age 15—65).
 „ (b) „ Rutlandshire (age 15—65).
 „ (c) „ Blackburn (age 15—65).
 „ (d) „ Blackburn (all ages).
 „ (e) „ Blackburn (all children under 5 years).

Chart C :—

- Curve (a) Death-rate from phthisis and respiratory diseases, Oldham (age 15—65).
 „ (b) Death-rate from phthisis only, Oldham (age 15—65).
 „ (c) Death-rate from phthisis and respiratory diseases, Blackburn (age 15—65).
 „ (d) Death-rate from phthisis only, Blackburn (age 15—65).
 „ (e) Death-rate from phthisis and respiratory diseases, Burnley (age 15—65).
 „ (f) Death-rate from phthisis only, Burnley (age 15—65).
 „ (g) Death-rate from phthisis and respiratory disease, Bolton (age 15—65).
 „ (h) Death-rate from phthisis only, Bolton (age 15—65).

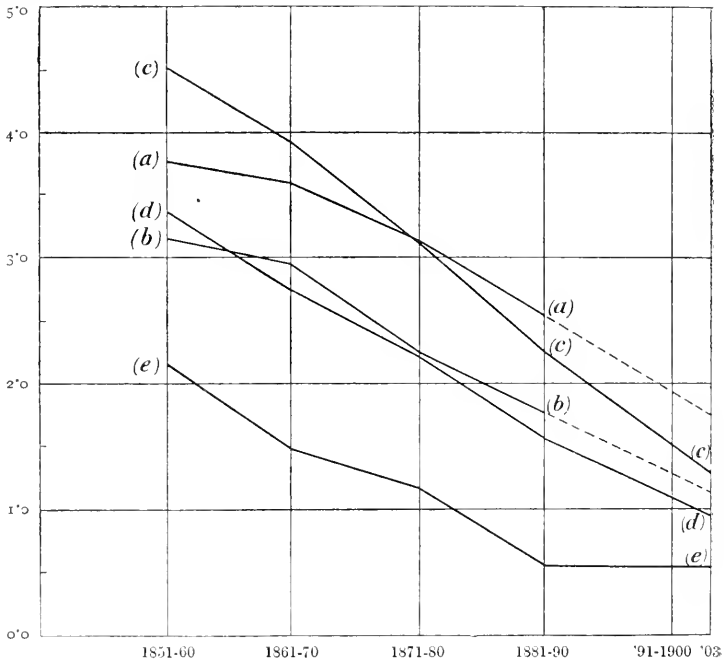
Death-rate
per 1,000.

CHART A.



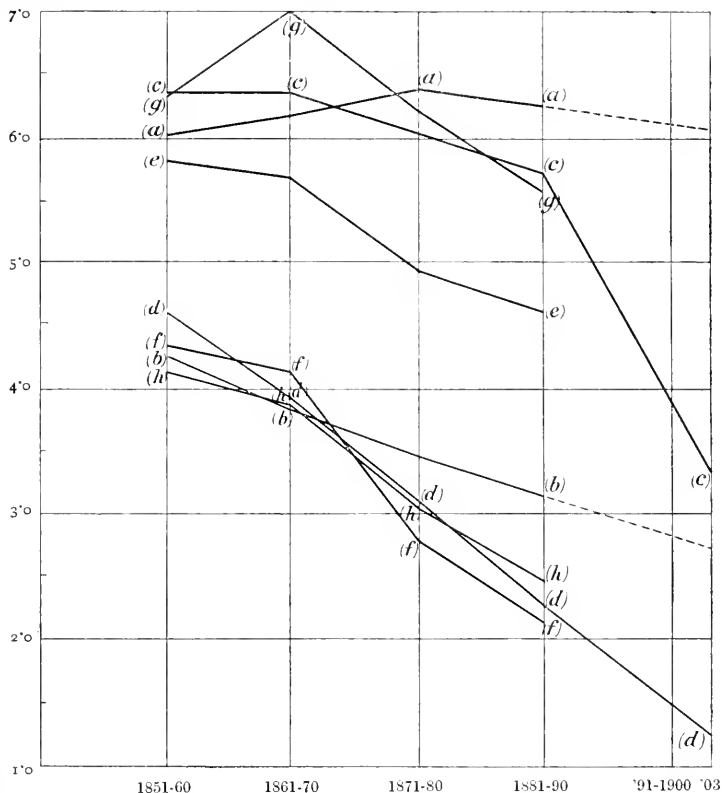
Death-rate
per 1,000.

CHART B.



Death-rate
per 1,000.

CHART C.



Now as to the teaching of these figures. First, as regards phthisis and respiratory diseases (combined), see Chart A, it will be observed that the death-rate for England and Wales from these diseases in the age-group 15—65 has been steadily falling since 1870, at which period it was only 0.03 in excess of the rate at 1860. There has also been a similar change in the rate for Rutlandshire, but in the latter it has diminished rather more rapidly. I am not called upon to explain these changes, but presumably sanitary reform is a potent factor here. From 1850 to 1890 the curve for Blackburn, although higher in the scale, diminished at practically the same rate as the curve for England and Wales, and had this gradual diminution gone on it would have been reasonable to expect that the rate for Blackburn in 1903 would be about 5.3, instead of which it had actually fallen to 3.34. It should be remembered that during this period of abnormal

diminution the Cotton Cloth Factories Act, 1889, had been actively enforced, and it would seem to have exerted a powerful influence in lowering the mortality of the age-group 15—65 in this district.

The death-rates for phthisis only (Chart B) for the same age-group point to the same conclusion.

Then as regards the curves on Chart C. The majority of the textile operatives in Oldham (of whom there are over 29,400) are employed in preparing, carding, and spinning of cotton, which processes have invariably been regarded as deleterious to health, carding because of the dust, and spinning from the absence of ventilation. In any place, therefore, where preparing and spinning predominate, the death-rates of the operatives from pulmonary affections might be expected to be excessive, and the curves indicate this to be the case in Oldham; at the later periods (1871-90) the curve for phthisis and respiratory diseases, and also the curve for phthisis only, both occupy the highest place in their respective groups. Here of course the Act of 1889 has had little influence, owing to the comparatively small number of humid sheds.²⁴ The death-rates, however, refer to the whole population (of the age-group 15—65) in the borough, and if we assume that the death-rates of persons other than textile operatives are about normal, it then becomes clear that even the excessive rates given might be increased if it were possible to extract the particulars relating only to the cotton operatives in Oldham.

The evidence of Mr. Holmes given before the Royal Commission on Labour led me to investigate the death-rates for Burnley, the rebuilding of the sheds and the improvement in the ventilation to which he referred should, I conjectured, show itself in diminished death-rates from pulmonary complaints. Both the curve for phthisis and respiratory diseases, and that for phthisis only, show a decided diminution during the period 1870-80. The phthisis decline is the more marked. Since the passing of the Act of 1889 the decrease in both death-rates has been steadily maintained.

Bolton occupies an intermediate position as regards the distribution of the operatives in the different processes: there is, however, a slight preponderance in the numbers employed in spinning, which condition should, *à priori*, give death-rates falling between the extremes of the group, but also inclined towards the higher figures, owing to the slight excess of spinners. The figures for the later periods show this to be the case.

The most noticeable feature in these figures is the very marked diminution in the death-rate from phthisis and respiratory diseases

²⁴ See "Chief Inspector of Factories Report," Cd-841, 1901.

which has taken place in Blackburn since 1890; and the above reasoning would seem to indicate that the lower death-rate has been largely brought about by the enforcement of the Cotton Cloth Factories Act of 1889.

An interesting paper by Mr. A. W. Watson,²⁵ which throws much light on the recent vital statistics of textile operatives, was read before the Institute of Actuaries in March, 1900. The paper deals with mortality, sickness, and secession experience of the Manchester Unity of Oddfellows, 1893-97. The writer divided the members into three groups—agricultural, Group I; textile, Group II; and manufacturing (textile excluded), Group III. His mortality tables succinctly show the rapid collapse of textile operatives in the later periods of life, commencing at the age of about 55 years. He also calculated the expectations of life for each group at different age-periods. The results, to which I have added figures for corresponding ages taken from the English Life Table, 1881-90, are shown below:—

Age.	Group I.	Group II.*	Group III.	English Life-Table, 1881-90.
				Males.
20.....	45.57	42.00	43.88	40.27
30.....	37.34	33.84	35.35	32.52
40.....	29.39	25.74	25.37	25.42
50.....	21.62	18.57	20.04	18.42
60.....	14.64	11.82	13.58	12.88
70.....	9.04	6.92	7.98	8.04
80.....	5.25	3.75	4.24	4.52

* The calculations for the textile group (II) are based on the "experience" amongst members of the Society in Lancashire, the West Riding, and part of Cheshire.

He also subdivided each group into urban and rural. The extremes of Groups I and II appear in the following table:—

Age.	Rural Class. Group I.	Urban Class. Group II.	Difference.	English Life-Table, 1881-90.
				Males.
20.....	46.3	41.3	5.0	40.27
30.....	37.8	33.3	4.5	32.52
40.....	29.8	25.2	4.6	25.42
50.....	22.0	18.2	3.8	18.42
60.....	15.0	11.7	3.3	12.88
70.....	9.3	7.1	3.2	8.04

²⁵ "Journal of the Institute of Actuaries," vol. xxxv, 1900.

From the first table it will be seen that textile operatives of the Manchester Unity have a greater expectation of life from the age of 20 years to about 55 years than that given in the new English Life Table, and the second table indicates that even the least favoured class have the advantage over the ordinary male up to nearly 40 years of age. This latter table also shows that the urban operative does not lose more than five years of life even when compared with the most favoured class of Group I. Fifty years before this Dr. Lyon Playfair had said :²⁶ "Every individual in Lancashire "loses nearly nineteen years, or nearly one half of the proper term "of his life, and that every adult loses more than ten years of life, "and from premature old age and sickness so much more than "that period of working life." Although it may be unsafe to push these comparisons too closely, it would seem that the textile operatives of 1893-97 had a decided advantage over the same class of 1840. How much of this gain was due to the enforcement of statutory sanitary requirements in the factories of the textile district will always be matter for conjecture, but for the purpose of this paper the above statistics may, I hope, be found sufficient.

The Sickness Experience of Textile Operatives.

My former remarks as to the necessity for more detailed information concerning the vital statistics of certain classes of textile operatives are also applicable, but with much greater emphasis, to the present subject. Practically the only returns of sickness useful for this paper are those published by the different friendly societies. The members of these societies probably represent only the more provident section of the working people employed in the better paid industries, consequently any calculations as to the relative sickness-pressures of different industries would rather underestimate the sickness-rate for those trades. On the other hand, to balance that tendency, it may be that persons who belong to a sick club are more readily inclined to abstain from work for slight indispositions which non-members would regard as too trivial to interfere with their employment. In any case, in the absence of returns covering a wider field, we must use the tables of the friendly societies as a standard of reference.

The sickness experience given in the two following tables (A and B) may be taken to represent the average sickness of the industrial classes at the different periods. The first gives the sickness rates at different age groups, the second gives the average rates irrespective of age :—

²⁶ "Health of Large Towns Commission," 1844, p. 60.

TABLE A.*

Age.	Neison's Government Returns, 1836-40. Males.		Finlaison's Government Returns, 1846-50. Males.		Manchester Unity of Oddfellows.					
	Number of Members Exposed to Risk.		Weeks' Sickness per Member per Annum.		1846-48. Males.		1856-60. Males.		1866-70. Males.	
					Number of Members Exposed to Risk.	Weeks' Sickness per Member per Annum.	Number of Members Exposed to Risk.	Weeks' Sickness per Member per Annum.	Number of Members Exposed to Risk.	Weeks' Sickness per Member per Annum.
20—	90,079	0·857	75,822	0·985	77,266	0·678	133,429	0·829	191,154	0·754
25—	160,969	0·890	119,896	0·985	145,349	0·758	172,867	0·820	274,642	0·806
30—	187,571	0·917	127,691	0·971	144,953	0·837	151,744	0·858	231,411	0·928
35—	182,091	1·036	117,583	1·091	116,561	0·940	151,342	1·004	162,818	1·062
40—	149,111	1·273	98,415	1·227	67,998	1·179	135,200	1·239	115,786	1·261
45—	120,032	1·634	81,283	1·437	38,311	1·515	111,682	1·545	102,118	1·634
50—	87,089	2·181	58,819	1·782	16,285	2·030	73,530	2·011	86,732	2·222
55—	61,947	3·048	43,012	2·177	5,894	3·206	42,659	3·025	70,952	3·047
60—	39,921	4·475	26,354	3·118	2,455	5·059	18,677	4·638	41,479	4·715
65—	23,817	10·012	15,163	4·622	874	6·495	6,147	7·165	21,693	7·237

* "Rates of Mortality and Sickness." By F. G. P. Neison, F.I.A., 1882.

TABLE B.*

Description and Nature of Experience.	Exposed to Risk of Sickness.	Total Sickness.		Average Rate of Sick Pay per Annum, Irrespective of Age.
		Weeks.	Days.	Weeks.
Males { 1856-60	722,338·4	1,166,208	1	1·6145
{ '61-70	1,789,532·0	3,199,138	5	1·7877
{ '70-80	1,662,561·5	3,147,044	1	1·8929
Females (England and } Wales), 1856-75..... }	139,122·0	325,612	5	2·3405
Males (Wales), 1856-75	167,255·0	357,457	4	2·1372

* "Report on Sickness and Mortality." By W. Sutton, F.I.A., 1896.

The various reports of Select Committees of the House of Commons and of Royal Commissions on the factories question contain a large number of returns relating to the sickness of the workpeople; but many of these are so obviously *ex parte* statements that they cannot be accepted as representing the true conditions obtaining.

Many returns of sickness were put in as evidence before the Select Committee of 1816, of which the following is an example: Mr. Sandford, a Manchester cotton manufacturer, handed in a statement relating to a sick club connected with St. Clement's and St. Luke's Sunday School. This club numbered about 500 members, of whom 212 worked in the cotton mills. During 1815 41 of these 212 members received 173 weeks' sick pay, *i.e.*, 4·2 weeks' sickness per person sick, or 0·816 week's sickness per "mill-hand" member. The average age of the 41 sick members was 15·6 years. He then proceeded to show that the mill workers experienced less sickness than the members employed in other places, but, waiving that point, his figures show that the amount of sickness prevailing at that period among the mill workers was rather excessive. This witness estimated that there were then employed in the cotton mills in Manchester about 11,600 persons under 18 years of age.²⁷

A somewhat similar return was submitted to the Factory Commissioners of 1833 by the Secretary of the Bolton Parish Church Sunday School Sick Society. This society numbered 563 members, of whom 274 were children employed in cotton mills. From the particulars given in the report, which covers two years, I find, as regards the mill hands, that 68 received 427 weeks' sick pay, *i.e.*, 6·25 weeks' sickness per annum per person

²⁷ "House of Commons Committee," 1816, p. 380.

sick, or 0·779 week's sickness per annum per mill operative member. The average age of the sick persons was 16·35 years.²⁸

So far as these isolated cases may be taken to represent the average conditions of the youthful cotton operatives generally, it would seem that the health of this class had slightly improved since 1815. Accepting this, we may assume that some of the improvement was indirectly due to the Act of 1819.

The sickness-rate of fine spinners was inquired into by Mr. J. Shuttleworth; the gist of his report²⁹ is as follows:—

The particulars relate to the 19 fine spinning mills in Manchester; 837 spinners were employed, whose average age was 32 years. They had worked in cotton mills on an average 22 years and 10 months each. In the year 1832, 255, or nearly 30·5 per cent., were absent on account of sickness; in the aggregate 6,296·5 days, or 24·6 days for each person sick, *i.e.*, an average of 1·25 weeks' sickness for the 837 spinners. This does not appear to be much in excess of the rates given in Mr. Neison's tables, but such immunity from excessive sickness is scarcely compatible with the evidence given concerning the conditions under which fine spinning was then carried on.

I have been unable to gather any further useful statistics relating to the sickness of cotton operatives, but sickness returns relating to the large towns of Lancashire may perhaps be taken approximately to represent the health of such workers. A report by the Rev. J. Clay³⁰ contains particulars of ten different sick benefit societies having members in the town of Preston. These societies numbered 1,534 members, and in the aggregate they experienced 2,057·7 weeks' sickness for the year ending 30th June, 1843, *i.e.*, on an average 1·34 weeks' sickness per member. No particulars as to age or occupation are given, but probably many were employed in the mills. Compared with the rates in Mr. Sutton's table, it would seem that the Preston friendly societies were experiencing less sickness than were friendly societies generally.

If the diminution in the death-rates from pulmonary affections in certain towns in Lancashire, to which I have already referred, had been brought about by improvement in the sanitary state of the cotton mills, the better conditions should also have reduced the sickness amongst the operatives, but unfortunately there are no statistics in existence by which this can be proved directly. The records of the Ancient Order of Foresters, however, would seem

²⁸ "Factory Commissioners' Report," 1833. D 2, pp. 138—140.

²⁹ *Journal of the Statistical Society*, vol. v, 1842, p. 268.

³⁰ "Health of Towns Commission," 1844, xviii, App., p. 48.

to prove that a decline in the sickness-rate among the members of that Society in Lancashire has actually taken place since about 1892, as shown by the following table:—

Table showing the Average Days' Sickness per Member in England and certain Counties. Ancient Order of Foresters.

	1875.	1880.	1885.	1890.	1891.	1892.	1893.	1894.
England	8·80	9·45	10·83	12·11	12·04	12·19	11·91	11·63
Lancashire ..	10·02	10·69	12·11	12·80	13·03	13·08	11·59	11·76
Northumberland	8·86	10·97	11·57	14·00	11·59	11·40	15·30	14·99
Durham	9·06	12·92	15·30	16·32	17·66	16·25	16·31	15·91

	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
England	12·71	11·91	12·54	12·65	12·99	13·47	12·83	13·37	13·57
Lancashire ..	13·52	12·76	12·89	13·13	13·09	13·21	11·79	12·09	12·95
Northumberland	16·70	15·70	17·32	17·88	17·30	18·34	18·35	19·19	19·80
Durham	17·83	15·83	16·93	17·30	17·92	19·40	19·38	19·84	10·03

On comparing the sickness-rate for Lancashire with that for the whole of England, it will be observed that from 1875 to 1892 the rates for that county were in excess of the rates for England, but from 1893 to 1903 their positions have been repeatedly reversed. On the other hand, it will be noticed that the rates in the non-textile and mining counties of Northumberland and Durham have during the same period been gradually rising. In 1903 there were upwards of 16,400 members of this society in Lancashire. Unfortunately, I have no means of ascertaining what percentage of these persons were engaged in cotton factories; but in the absence of any other important hygienic improvement to account for the relative fall in the Lancashire rate, the apparent diminution may be looked upon as being due to the statutory requirements concerning the hygienic conditions of textile factories. The change is not very marked, I admit, but bearing in mind the appreciable diminution in the death-rates referred to previously, it seems not unreasonable to attach the (relative) decline in the sickness-pressure to the same cause.

Physique of Textile Operatives.

“If ever we are forced to yield the foremost place among commercial nations, we shall yield it to some people pre-eminently vigorous in body and in mind.”—MACAULAY.

There are comparatively few statistics in existence which throw light on this subject. The measurements of heights and weights of factory and non-factory children given in the Report of the Factory

Commissioners of 1833 appear to be the first records of such measurements on a large scale.

Two Sunday schools in Manchester and one at Stockport (these places were the centre of the cotton industry at that time) were visited, and measurements were taken of 1,062 children who were employed in the mills, and 428 children who were engaged in other occupations. Further, it was ascertained that the forbears of the majority of the "mill-hands" were, or had been, similarly employed. For economising space and facilitating comparisons I have re-grouped the numbers quoted in the Report.³¹ See the following tables:—

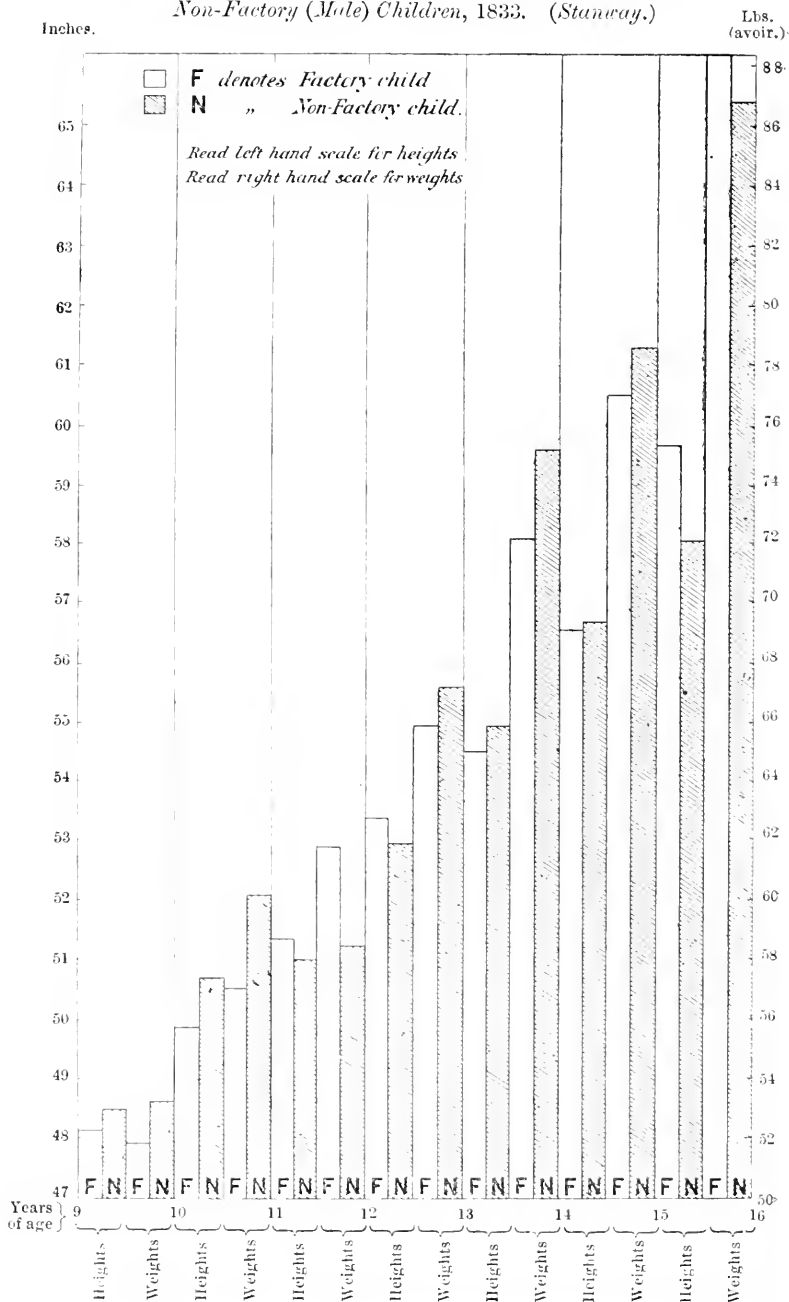
Table showing the Comparative Heights and Weights of Factory and Non-Factory Children, 1833.

Age.	Sex.	Height.				Weight.			
		Employed in Factories.		Not Employed in Factories.		Employed in Factories.		Not Employed in Factories.	
		Number Measured.	Average Height.	Number Measured.	Average Height.	Number Weighed.	Average Weight.	Number Weighed.	Average Weight.
			inches.		inches.		lbs.		lbs.
9	Males	17	48·139	41	48·564	17	51·76	41	53·26
	Females	30	47·970	43	48·838	30	51·13	43	50·44
10	Males	48	49·789	28	50·650	48	57·00	28	60·28
	Females	41	49·624	38	49·371	41	54·80	38	54·44
11	Males	53	51·261	25	51·005	53	61·84	25	58·36
	Females	53	51·155	29	52·099	53	59·69	29	61·13
12	Males	42	53·380	20	52·962	42	65·97	20	67·25
	Females	80	53·703	27	53·666	80	66·08	27	66·07
13	Males	45	54·477	22	54·977	45	72·11	22	75·36
	Females	63	55·636	18	55·069	63	73·25	18	72·72
14	Males	51	56·585	16	56·625	61	77·09	16	78·68
	Females	81	57·745	16	58·226	80	83·41	16	83·43
15	Males	54	59·638	24	58·020	54	88·35	24	86·83
	Females	81	58·503	13	59·153	81	87·86	13	93·61
16	Males	52	61·600	16	63·201	52	98·00	13	110·30
	Females	83	59·811	6	58·083	83	96·22	6	91·16
17	Males	26	62·673	20	64·068	26	104·46	20	117·80
	Females	75	60·413	9	60·708	75	100·21	9	102·44
18	Males	22	63·318	15	69·891	22	106·13	14	126·30
	Females	65	62·721	2	64·750	65	106·35	2	122·00

The following Chart expresses the same facts as the numbers given in the above table:—

³¹ "Factory Commission," 1833.

Chart showing Relative Heights and Weights of Factory and Non-Factory (Male) Children, 1833. (Stanway.)



It will be observed that with the exception of the last two age-groups (17 and 18) the difference, either in height or weight, between the two classes of children (sex for sex) is inappreciable, from which it seems reasonable to infer, so far as comparisons are permissible from superficial measurements, that the children were equally healthy. Deductions on the above investigation must not be pushed too far. In the first place the numbers examined were comparatively small, and there are no recorded comparisons between the two classes at any earlier period; but assuming that the children of the two groups were originally on an equality, it would seem that physical deterioration of the mill operatives had been retarded, if not altogether prevented. Accepting this, it would still be impossible to determine how much was due to (a) the regulation of the hours of employment, (b) the introduction of statutory primitive sanitary measures in the factories, (c) the general improvement in the domestic comforts of the workpeople, and (d) greater attention to public hygiene. These causes being so intimately connected, no reliable estimate of their comparative influence could be adduced.

Under the Act of 1833 the medical examination of children for fitness for employment in factories was first introduced. Three years later, Mr. Horner,³² H.M. Inspector of Factories, caused an extensive inquiry to be made in order to obtain information by which a standard of physical development could be fixed, which should serve as a guide to the certifying surgeons. He obtained from seventy-two surgeons in his district (North-Western Counties) measurements of 16,400 children of the working classes between the ages of 8 and 14 years. From the results obtained he laid down the following *minimum* standards:—

Children 3 feet 10 inches in height (without shoes) could be accepted as of 9 years of age.

Children 3 feet 11½ inches in height (without shoes) could be accepted as of 10 years of age.

Children 4 feet 1 inch in height (without shoes) could be accepted as of 11 years of age.

Children 4 feet 2 inches in height (without shoes) could be accepted as of 12 years of age.

Children 4 feet 3½ inches in height (without shoes) could be accepted as of 13 years of age.

It is unfortunate that the results of these observations are not available. Except in a few isolated cases, no further investigations

³² "H.M. Inspectors of Factories Reports, 1837. Mr. Horner's report," 18th January, 1837.

were carried out until 1873, when Dr. Bridges and Mr. Holmes, whose report I have previously referred to, caused an inquiry on a large scale to be carried out. In all, about 10,000 children were examined; these were divided into three groups, namely, children employed in (a) urban textile factory districts, (b) suburban textile factory districts, and (c) non-factory districts. The result of their investigations showed that the factory children of factory parents (urban and suburban) were inferior in height and weight to children in the non-factory districts (urban and rural), as shown in the table set out below:—³³

Table showing the Comparative Heights and Weights of Factory Children of Factory Parents (Urban and Suburban) and Children in the Non-Factory Districts (Urban and Rural). 1873.

Age.	Boys.				Girls.			
	Factory Children.		Non-Factory Children.		Factory Children.		Non-Factory Children.	
	Number Examined.	Height in Inches.	Number Examined.	Height in Inches.	Number Examined.	Height in Inches.	Number Examined.	Height in Inches.
9.....	80	48·05	230	49·21	110	47·62	160	48·63
10.....	140	49·77	240	51·00	130	49·52	140	50·07
11.....	130	51·44	180	52·87	120	50·80	140	52·66
12.....	120	52·82	150	54·05	140	53·13	90	54·41
9.....	80	Weight in lbs. 58·41	230	Weight in lbs. 60·02	110	Weight in lbs. 54·63	160	Weight in lbs. 56·53
10.....	140	62·14	240	65·29	130	59·75	140	61·19
11.....	130	67·22	180	71·01	120	63·94	140	68·00
12.....	120	70·74	150	75·00	140	71·46	90	75·95

These comparisons, however, teach us little beyond the fact that children in two different social classes vary in height and weight, the class higher in the scale (non-factory) holding the advantage as to external measurements. But beyond that these observations are of special interest in that they afford the means by which comparison can be made between the factory children of 1873 and the factory children of 1833. The figures are tabulated below:—³⁴

³³ "Report to the Local Government Board on the Proposed Changes in 'Hours and Ages of Employment in Textile Factories.'" By Dr. Bridges and Mr. T. Holmes, 1873.

³⁴ "Factory Commission," 1833, and "Report to Local Government Board," 1873.

Table showing the Comparative Heights and Weights of Factory Children in 1833 and Factory Children of Factory Parents (Urban and Suburban) in 1873.

Age.	Boys.				Girls.			
	1833.		1873.		1833.		1873.	
	Number.	Height in Inches.	Number.	Height in Inches.	Number.	Height in Inches.	Number.	Height in Inches.
9.....	17	48·13	80	48·05	30	47·97	110	47·62
10.....	48	49·78	140	49·77	41	49·62	130	49·52
11.....	53	52·26	130	51·44	53	51·15	120	50·80
12.....	42	53·38	120	52·82	80	53·70	140	53·13
		Weight in lbs.		Weight in lbs.		Weight in lbs.		Weight in lbs.
9.....	17	51·76	80	55·60	30	51·13	110	54·63
10.....	48	57·00	140	58·41	41	54·80	130	59·75
11.....	53	61·84	130	62·14	53	59·69	120	63·94
12.....	42	65·97	120	67·22	80	66·08	140	71·46

These groups, however, are not strictly comparable, for whilst the children of 1833 were employed solely in cotton mills, those in the later period were employed in cotton, woollen, and silk factories. There is nothing to show whether the woollen and silk operatives were of better physique than those employed in cotton mills, but seeing that the factory system had not fully developed even as late as 1840 in the woollen industry, and further, that employment in this industry was admittedly less harmful than in the cotton mills, any comparison between the two groups given in the table would be rendered more or less erroneous by the presence in the 1873 group of greater or smaller proportions of wool operatives. With the above reservations, however, the figures show that the children of both sexes employed in textile factories in 1873 had, on the whole, the advantage of children employed in cotton mills in 1833. In heights they practically agree, the main difference appearing in the weights.

But in order to test the effect of the Factory Acts we must ascertain the growth of non-factory children during the same period (1833-73). The figures are appended :—³⁵

³⁵ "Factory Commission," 1833, and "Report to Local Government Board," 1873.

Table showing the Comparative Heights and Weights of Non-Factory Children in 1833, and Non-Factory Children in Factory Districts in 1873.

Age.	Boys.				Girls.			
	1833.		1873.		1833.		1873.	
	Number Ex- amined.	Height in Inches.	Number Ex- amined.	Height in Inches.	Number Ex- amined.	Height in Inches.	Number Ex- amined.	Height in Inches.
9	41	48·564	60	49·09	43	48·438	30	49·37
10.....	28	50·650	50	51·02	38	49·371	30	49·76
11.....	25	51·005	30	52·57	29	52·099	30	52·80
12.....	20	52·962	20	53·56	27	53·666	17	53·39
		Weight in lbs.		Weight in lbs.		Weight in lbs.		Weight in lbs.
9	41	53·26	60	59·40	43	50·44	30	57·79
10.....	28	60·28	50	63·76	38	54·44	30	60·78
11	25	58·36	30	70·22	29	61·13	30	68·97
12.....	20	67·25	20	70·94	27	66·07	17	70·55

It will be noticed that the non-factory child of 1873 had an appreciable superiority both in height and weight, more particularly in weight, over the non-factory child of 1833. The differences here are much greater than the differences between the *factory* child of the two periods, or in other words the growth of the factory child had been retarded. How much of that retardation had been brought about by the employment of the child, and how much by other causes, is not apparent; in any case it would seem that the effect of factory legislation had been to prevent undue physical deterioration of these young labourers.

The number of physical observations made in 1833 and in 1873 was of course far too small to permit of any reliable conclusions to be arrived at, but in the absence of contrary evidence it may be assumed that the results approximately represent the average children of the two periods. On this subject of physical deterioration there is much conflicting evidence: many—including some eminent medical men—assert that the factory children have seriously degenerated; others, of equal eminence and ability, maintain that no such retrogression has taken place. Judging by the above facts, however, it seems that the factory children have deteriorated in the sense that their growth has not kept pace with that of children living under more favourable conditions. The extent to which children may develop when reared under suitable circumstances is shown in the case of boys of the Friends' (Quakers') School at York, as below:—³⁶

³⁶ "Final Report of Anthropometric Committee of the British Association," Table 25.

Table showing the Average Stature and Weight of Boys in the York Friends' School for Twenty-seven Years, 1853-79.

Age last Birth-day.	Number of Observations.	Stature.				Weight.			
		Twenty-seven Years, 1853 to 1879.	Nine Years, 1853 to 1861.	Nine Years, 1862 to 1870.	Nine Years, 1871 to 1879.	Twenty-seven Years, 1853 to 1879.	Nine Years, 1853 to 1861.	Nine Years, 1862 to 1870.	Nine Years, 1871 to 1879.
		Inches.	Inches.	Inches.	Inches.	Lbs.	Lbs.	Lbs.	Lbs.
9.....	13	51·5	51·4	49·7	53·4	62·9	63·2	54·2*	70·3
10.....	86	53·3	53·9	51·6*	54·7	68·5	71·6	61·1*	74·2
11.....	261	56·4	56·5	56·1	56·5	79·7	80·3	76·1	81·2
12.....	585	57·7	58·0	57·9	57·4	85·8	86·2	86·1	85·4
13.....	874	59·9	60·6	59·9	59·6	95·4	96·9	95·0	95·0
14.....	1,117	62·1	62·1	62·3	61·9	106·0	105·8	107·0	105·4
15.....	1,174	64·2	63·9	64·3	64·2	116·6	113·5	117·2	117·2
16.....	515	66·1	65·4	66·1	66·3	127·8	122·2	126·6	130·2
17.....	36	67·2	—	67·0	67·4	136·3	—	130·0	138·6
	4,661								

* These values are too low, due probably to some error of observation.

On comparing these measurements with the measurements of children in non-factory districts (urban and rural), 1873 Report, it will be noticed that the Friends' School boys have a very marked advantage both in height and weight. It would seem therefore that the urban *factory* child experiences a double disadvantage, first on account of his employment, as shown by comparison with the non-factory child, and secondly, from his environment outside the factory, as shown by comparing the non-factory child with the Friends' School boy.

Dr. Charles Roberts, writing (in 1876) on the "Physical Requirements of Factory Children,"³⁷ referred to the reports of 1833 and 1873, as follows: "It would, indeed, be very deplorable "if, after forty years of protective legislation, no decided "improvements had taken place in the health and physical "development of the factory operatives; and such statistical "evidence as I have been able to collect shows that some "improvement has taken place. Thus, on comparing the weights "of factory children given by Stanway in the report of the Royal "Commission, 1833, and those . . . taken in 1873, the result "is highly in favour of the latter."

³⁷ *Journal of the Statistical Society*, 1876, vol. xxxix, p. 681.

Average Weights.

		Age Last Birthday.			
		9.	10.	11.	12.
Factory children {	1873	58.56	61.65	66.68	70.57
	1833	51.76	57.00	61.84	65.97
Difference		6.80	4.55	4.84	4.60

It will be observed that this differs slightly from the comparisons I have made. Dr. Roberts may have included a large percentage of suburban children in his calculations for 1873. This, however, would tend to vitiate the comparison, because the factory children of 1833 were distinctly urban.

Since 1873 no measurements have been carried out on a scale of sufficient magnitude to permit of a reliable comparison between modern factory children and those of earlier periods. A few observations, however, have been made which throw some light on the subject.

In 1891 the Rev. J. M. Wilson, Vicar of Rochdale, caused measurements to be made of all boys in his school. He found that the average growth received a sudden check at 10 years of age; this corresponded with the age of employment for half-timers. In 1894 he repeated the measurements, and found the check at 10 had disappeared, but a slighter break was apparent at 11 years of age (the Act of 1891 raised the age for employment of half-timers from 10 to 11 years). He stated, "these measures, so far as they went, proved that the work of these children in the mills from "10 to 11 stunted their growth."³⁸

In December, 1898, the "Daily News" caused measurements to be made of 640 Heywood boys between 11 and 13 years of age. The results,³⁹ arranged in four groups, are given below:—

Age.	Number of Observations.	Height in Inches.	Weight in lbs.
11½	123	51.7	64.3
12	260	52.4	67.0
12½	140	53.3	68.8
13	117	53.8	69.5

These results show a slight diminution compared with those of 1873, but as the observations were limited to a particular town and class of persons, no general deductions are permissible.

³⁸ "Labour Leader," May, 1895.

³⁹ "Daily News," 4th January, 1899.

Of a like nature are some measurements carried out by Mr. H. J. Wilson, H.M. Inspector of Factories for the Dundee district.

“The present race of mill workers in Dundee are the descendants of generations of operatives, there being little intermarriage in this class with persons of rural origin.

“Towards the close of last year I measured 169 boys and girls, and weighed them, with a view to discovering the amount of degeneracy as compared with the recognised normal for children of the ages specified . . . The children and young persons were exclusively employed in jute mills in the heart of Dundee, and were taken indiscriminately, so as to secure, as far as possible, a fair average.”⁴⁰

Age.		Dundee.		Treves.	
		Height in inches.	Weight in lbs.	Height in inches.	Weight in lbs.
11—12 years	{ M.	50·0	62·8	53·5	72·0
	{ F.	51·5	63·0	53·0	68·1
12—13 "	{ M.	52·75	68·5	54·3	76·7
	{ F.	53·0	68·0	55·5	76·4
13—14 "	{ M.	53·5	68·9	56·75	82·6
	{ F.	54·5	76·0	57·7	87·2
14—15 "	{ M.	54·0	70·5	59·0	72·0
	{ F.	55·75	77·5	59·75	96·1

Altogether there is abundant evidence to prove that in textile districts there are large numbers of persons below the average stature and weight, but how far protective legislation has arrested degeneration is more or less matter for conjecture; the foregoing facts, however, clearly show that the hygienic conditions of the environments of the people—more particularly perhaps during the earlier periods of life—both in the factories and elsewhere, are all-important factors in the matter of physical development, as is so unmistakably proved by the records concerning the Friends' School boys at York.

⁴⁰ “Annual Report of Chief Inspector of Factories,” 1900, p. 336.

“The ultimate end of factory legislation is to prescribe conditions of existence below which population shall not decline.”—THE TIMES, 12th January, 1874.

Flax and Linen Manufacture.

The protective provisions of the Factory Acts were first extended to workers in flax and linen mills by the Act of 1833. The reports of Dr. Thackrah⁴¹ and Dr. Drinkwater⁴² on flax mills give corroborative evidence of the detrimental effects of employment in many branches of this industry.

Another valuable report⁴³ on this subject was written in 1893, by Mr. E. H. Osborn, one of H.M. Inspectors of Factories, who had devoted much attention to the question of ventilation in flax mills and cotton cloth factories; and the Royal Commission on Labour, 1892-94, also called attention to the necessity for special precautions in this industry.⁴⁴

Subsequent to these reports came the compulsory use of fans in dusty processes, and other precautionary measures for the amelioration of the conditions of employment in flax and linen mills. Concerning the operation of these special rules, Mr. Williams wrote⁴⁵: “It is questionable whether, in the whole history of Factory Act administration, there is any instance of better work being done by the department than in this matter.” Captain Smith also recognises the benefits which have accrued to the workers from the same cause.⁴⁶

These healthier conditions should, naturally, result in a decrease in the death-rate from phthisis and respiratory diseases of the workers concerned. Unfortunately, few statistics directly bearing on the matter have been published recently, but the following figures, extracted from the Report of the Medical Officer of Health for the city of Belfast, for the year 1902, show steady improvement is proceeding in that city. How far the enforcement of the special rules has influenced the death-rates from phthisis and respiratory diseases I have no means of estimating. But in view of the large number of textile operatives in Belfast (there are probably at least 35,000 employed in that city), it would, perhaps, not be too much to say that the decrease in the number of deaths from phthisis and

⁴¹ “Factory Commission, 1883. Mr. Drinkwater’s Report,” C-1, p. 168.

⁴² *Ibid.*, p. 165.

⁴³ “Report on Flax Mills and Linen Factories.” By Mr. E. H. Osborn, C-7287, 1894.

⁴⁴ “Royal Commission on Labour.” Group C., App. III, p. 515.

⁴⁵ “Annual Report of Chief Inspector of Factories,” 1899, p. 286.

⁴⁶ “Report upon Flax Mills.” By Commander Hamilton P. Smith, R.N. 1904, p. 5.

respiratory diseases (see table below) has been principally brought about by the operation of the statutory measures referred to.

Year.	Deaths from		
	Phthisis.	Diseases of the Respiratory Organs.	Total.
1893.....	1,016	1,564	2,580
'94.....	977	1,537	2,514
'95.....	1,083	1,880	2,963
'96.....	1,008	1,640	2,648
'97.....	995	1,675	2,670
'98.....	1,044	1,658	2,702
'99.....	1,112	1,753	2,865
1900.....	1,115	1,784	2,899
'01.....	1,092	1,636	2,728
'02.....	1,132	1,779	2,911

Dr. Whitaker's words are interesting :—⁴⁷

“ Of the 2,911 deaths reported from these causes, 1,779 were attributed to diseases of the respiratory organs, and 1,132 to phthisis. It is therefore evident that these diseases caused upwards of one-third of the mortality in our midst. This is not to be wondered at when we remember the nature of the occupations in which so many of our people are engaged, and the unhealthy surroundings which environ them.”

“ I would also call your attention to the above table, which shows the number of deaths which occurred in the city of Belfast during the past ten years from these diseases. When the large increase in our population is considered, a marked and almost gradual decrease is observed therein. The death-rate therefrom, *which was 10·9 per 1,000 in 1891, was only 8·0 in 1902. The deaths from phthisis, which numbered one in every 250 of the population in 1891, were one in 318 in 1902, showing a steady and gradual improvement.*”

Certain Non-Textile Industries. Pottery Manufacture.

Although the protective provisions of the Factory Acts were not extended to persons employed in the manufacture of earthenware until the year 1864, it must not be supposed that the attention of the Legislature had not been directed to this industry until that period. It appears that the necessity for regulation had been more or less apparent for nearly half a century.

⁴⁷ “ Report on the Health of the City of Belfast for 1902.” By Dr. Whitaker, Medical Officer of Health for the City.

The Select Committee of 1816 called many witnesses from various trades, and Mr. Josiah Wedgwood (presumably the son of the great Josiah Wedgwood) gave evidence on behalf of the pottery manufacturers of North Staffordshire. He stated that the manufacturers as a body objected to the principle of interference in the conduct of their business until a case was made out for the necessity of such interference. The witness agreed that the process of dipping was unwholesome, on account of the white lead used. Children and young persons were employed to assist the dippers. The witness thought the paintresses were generally less robust than persons whose employments were not sedentary, but he could see no remedy for the evil.

The efforts of the manufacturers were, so far, successful, for the provisions of the Act of 1819 were limited to cotton mills.

The Commissioners of 1833 took the pottery question in hand, and addressed a circular containing seventy-nine queries to many manufacturers, including potters. Answers were received from twenty-four pottery manufacturers in North Staffordshire, from which it appeared that the attitude of the bulk of the manufacturers towards State interference had not materially changed since 1816.

It has repeatedly been observed that agitation for the protection of the health of the workers in any particular trade often leads to a considerable amount of voluntary action on the part of the more liberal manufacturers concerned. The evidence taken by the 1833 Commissioners, however, seemed to prove that the movement of 1816 had had little permanent effect so far as the pottery trade was concerned.

The Lady Sub-Commissioner in 1841, who made an extensive inquiry into the conditions of employment in the potteries, reported much in the same strain as did the Commissioners of 1833, particularly as to the injurious effects of the dust in the process of scouring, which dust was "nearly as fatal as that of the grinding stones of Sheffield."⁴⁸

The decennial census of 1851 showed that in certain districts there existed excessively high mortality rates from lung diseases, and the results of the exhaustive inquiry of Dr. Greenhow in 1860 conclusively prove that no appreciable amelioration of the conditions of the pottery operatives had taken place since the inquiry of 1833. In his report he deals more particularly with the dusty processes, and points out that the chief sufferers are the china scourers, and

⁴⁸ "Royal Commission for Enquiring into the Employment of Children and 'Young Persons,' 1841.

that certain of the potters—flat-pressers, hollow-ware pressers, throwers, turners, and sagger makers—are exposed in different degrees to the influence of a dusty atmosphere, all in a less degree than the china scourers, but some of them, especially the flat pressers, in a degree which is most injurious to health.

Evidence as to the baneful effects of this industry was given by the late Dr. J. T. Arlidge (Senior Physician of the North Staffordshire Infirmary), in a small pamphlet published in 1864.

If further evidence as to the unfavourable sanitary condition of the pottery operatives is wanted, one has simply to refer to the exhaustive reports of the third great Factory Commission. Eventually the Commissioners recommended the extension of the existing Factory Acts to the industry, and their recommendations were embodied in the Bill of the next session (1864). In moving the second reading, Mr. H. A. Bruce, in a lengthy statement, reviewed the conditions of the women, young persons, and children employed in the potteries, as described in the reports of Dr. Greenhow and the Commissioners. He added: "Those statements, however, having been the subject of much discussion, he would fortify them by independent evidence which fully sustained their general accuracy."

The figures quoted, which I have put into tabular form, need no comment.

A Comparison between the Deaths from Phthisis and other Diseases of the Chest of Persons of Both Sexes between Certain Age-groups, for Stoke-on-Trent and certain Districts of Northumberland and England and Wales.

District.	Deaths per 100,000 living.					
	25—45.		45—55.		55—65.	
	Males.	Females.	Males.	Females.	Males.	Females.
Stoke-on-Trent	584	542	1,309	542	1,787	882
Northumberland	335	406	322	361	477	407
England and Wales	512	518	692	518	995	741

The Factory Act of 1864 which followed contained several new features in factory legislation; here the idea of *local* ventilation was first introduced. (I have already referred to the omission in the earlier Factory Acts of provisions relating to the general sanitation, ventilation, cleanliness, lavatory accommodation, &c., of the factories.) In addition here appears the first attempt to introduce the system of "Special Rules" (already in operation under the Mining Acts);

but the special rules for factories were optional, and the arbitration clauses were omitted. After approval by one of H.M. Principal Secretaries of State, these special rules were equivalent to ordinary statutory enactments. Many manufacturers took advantage of this clause, and special rules were duly established, but, strangely enough, the immediate effect of this arrangement was the transference of the responsibility for the cleanliness of the workrooms from the manufacturer to the operatives, although the primary responsibility for keeping the factory in a cleanly state was placed, by the Acts, on the occupier.

As a further precaution against injury to health, no woman, young person, or child was allowed to take meals, or to remain during meal times in the dipping houses, dippers' drying rooms, or china scouring rooms.

The succeeding Act (1867), although applying to the regulated factories generally, contained a clause which strengthened the hands of the inspector in dealing with dust in potteries, for he could direct the occupier to provide a fan, or other mechanical means, for preventing the inhalation of dust in any process in which dust was generated and inhaled by the workman to an injurious extent, but the necessity of proving injury in each individual case rendered the procedure cumbersome, and reduced the effect of the clause to a minimum.

After the passing of the 1867 Act no regulations directed specially to this industry were passed until 1882, when, in December of that year, the Secretary of State made an Order prohibiting the taking of meals in majolica painting shops. In the meantime the consolidating Act of 1878 was passed; this repealed the Act of 1864, and with it the optional arrangement as to special rules also disappeared.⁴⁹

The Act of 1891, although not directed to potteries particularly, may perhaps be regarded as the most important epoch in the history of factory legislation concerning potteries, in that it provided the machinery by which "special rules . . . or such special "measures as appear to the chief inspector to be reasonably "practicable," could be proposed in cases "where the Secretary of "State certifies that in his opinion any machinery, or process, or "particular description of manual labour used in a factory . . . is "dangerous or injurious to health, or dangerous to life or limb."

Towards the latter end of the following year the Royal Commissioners on Labour reported, and their report, so far as it

⁴⁹ "Report on China and Earthenware Factories, North Staffordshire." By William Dawkins Cramp, Esq., H.M. Superintending Inspector of Factories, 1892.

concerns the manufacture of pottery, is in effect a reiteration of the reports of the previous investigators. The Commissioners suggested that remedial measures were urgently needed.

Immediately after the issue of this report, Mr. W. Dawkins Cramp, H.M. Superintending Inspector of Factories, reported on this industry. He suggested "that the Secretary of State be asked to certify that, in his opinion, the processes of china and earthenware making are injurious to health. . . ." He also appended a draft code of special rules, which embodied important sanitary clauses. Following Mr. Cramp's suggestion, the Secretary of State, in December, 1892, certified the making of china and earthenware to be dangerous, and issued the draft rules for observations from the manufacturers and workpeople concerned. As differences of opinion arose, the Secretary of State appointed a small committee "to make an inquiry into the conditions under which the manufacture of pottery is carried on, with the object of diminishing any proved ill effects in the health of the workpeople engaged therein."⁵⁰

The Committee fully corroborated Mr. Cramp's remarks as to excessive mortality from lung troubles among the workers in the dusty processes, and as to the ill effects resulting from the use of lead in glaze. They recommended the adoption of the draft rules, to which they had added amendments for converting the general requirement as to the efficient measures for removal of dust into a definite obligation in specified processes, and they added a rule aiming at the prevention of excessive temperatures in the work rooms. The special rules suggested by the Committee were duly established in the following year.

By the Act of 1895 certain diseases, including lead poisoning, were made reportable to the Chief Inspector of Factories. As the result of this compulsory notification it was apparent that lead poisoning was rife to an alarming extent in the potteries, as shown by the following figures :—

*Number of Cases of Lead Poisoning Reported from Potteries for the Years 1896, 1897, and 1898.**

	1896.	1897.	1898.	Total.
	432	446	457	1,335

* "Annual Reports of Chief Inspector of Factories," 1896, 1897, and 1898.

⁵⁰ "The Conditions of Labour in Potteries." C-7240, 1893.

The seriousness of these figures becomes more apparent when the comparatively small number of persons coming into contact with the lead is taken into consideration. In 1898 there were 4,703 persons employed in "lead processes" in the Potteries district;⁵¹ these constitute about four-fifths of the total pottery lead workers in the kingdom. There were therefore *less than 6,000 workers exposed to risk, and of this number 1,335 cases of lead poisoning were reported in three years.* To meet this, revised special rules, which were a great advance on the earlier code, were issued in May, 1898. Here was instituted the monthly medical examination of all women and young persons employed in specified dangerous processes, and power was given to the certifying surgeons to order suspension from such employment. The clauses of the 1894 rules relating to overalls and head coverings and lavatories were here repeated, and the earlier rule as to the provision of fans in towing and china scouring was extended to ground laying, colour dusting, glazing blowing, and transfer making. Rule 7 provided that "all workshops, and all parts of factories, shall be effectually "ventilated."

These rules were not established in all potteries alike. A section of the manufacturers objected to some of the clauses, and the matter was submitted to arbitration. The rules dated October, 1898, as settled by the award of Mr. Dugdale, Q.C., however, were in substantial agreement with the May draft.

The special rules of 1898 were productive of beneficial effect on the health of the workers, as shown in the succeeding sections on this subject, but they did not strike at the root of the evil of lead poisoning. In order to gain further information and advice on the subject, the Secretary of State, in May, 1898, requested Professors Thorpe and Oliver to make an inquiry into the hygienic question involved in the use of compounds of lead in pottery processes.

It is not in the province of this Paper to enter into, and discuss, all the ramifications of the highly technical report of Drs. Thorpe and Oliver, which was published in February, 1899. The conclusions they arrived at, however, are material:—⁵²

"1. That by far the greater amount of earthenware of the "class already specified⁵³ can be glazed without the use of lead in "any form. . . . There seems no reason, therefore, why in the

⁵¹ "The Employment of Lead Compounds in the Manufacture of Pottery." By Professor Thorpe and Professor Oliver. C-9207, 1899.

⁵² *Ibid.*, p. 15.

⁵³ *Ibid.*, p. 2. All kinds of table, domestic, and sanitary ware, china furniture, and electric sundries; white, cream, buff, and printed tiles, which involve about one-tenth of the total output in the Potteries.

“ manufacture of this class of goods the operatives should still
 “ continue to be exposed to the evils which the use of lead glaze
 “ entails.”

“ 2. There are, however, certain branches of the pottery industry
 “ in which it would be more difficult to dispense with the use of
 “ lead compounds. But there is no reason why, in these cases, the
 “ lead so employed should not be in the form of a fritted double
 “ silicate. . . .”

“ 3. The use of raw lead as an ingredient of glazing material,
 “ or as an ingredient of colours which have to be subsequently
 “ fired, should be absolutely prohibited.”

“ 4. As it would be very difficult to ensure that an innocuous
 “ lead glaze should be employed, we are of opinion that young
 “ persons and women should be excluded from employment as
 “ dippers, dippers’ assistants, ware cleaners after dippers, and glost
 “ placers in factories where lead glaze is used, and the adult male
 “ dippers, &c. . . . should be subjected to systematic medical
 “ inspection.”

Judging by the articles and correspondence in the Press which followed the issue of this report, the recommendations of the professors created intense feeling and excitement among the parties interested. The manufacturers, on the one hand, asserted that the special rules of 1898 would, with a little strengthening, by including all workers in the monthly medical examination, be found sufficient. They, however, expressed themselves as prepared “to reduce to a *fritt* all the lead used in their glazes.”⁵⁴ The workpeople, on the other hand, although pressing for further protection, were somewhat at cross purposes. The advocates for the women workers contended that their exclusion from certain processes was not a solution of the problem; whereas the men, for obvious reasons, favoured the exclusion of the women.

In August of the following year the Home Office issued a draft of revised special rules, in which the more important recommendations as to the use of lead were embodied. Subsequently “certain modifications were made, and others agreed upon in principle, but as regards the standards of insolubility of lead used in glazes the views of the manufacturers were at variance with those of the expert advisers of the Home Office, and arbitration became inevitable.”⁵⁵ The arbitration⁵⁶ on the rules which were

⁵⁴ “Annual Report of Chief Inspector of Factories,” 1899, p. 310.

⁵⁵ *Ibid.*, 1900, p. 13.

⁵⁶ The Act of 1895 provided for the representation of workmen at arbitration proceedings as to special rules. In this connection it is interesting to recall words used by Dr. John Simon (afterwards Sir John) in 1862, regarding the

issued by the Home Office in February, 1901, took place in November, 1901, Lord James of Hereford acting as umpire.

After hearing the case for the Home Office, and part of the evidence for the manufacturers, the umpire adjourned the proceedings for eighteen months; but he issued an interim code of rules, which were duly enforced. The proceedings were resumed in June, 1903, and in December of the same year Lord James issued his final award.⁵⁷ The final code, as settled by the combined awards of Lord James, which is now in force, mainly follows on the lines of the earlier code, but amplifications and extensions which experience has shown to be necessary are here embodied. Monthly medical examination is now required of *all* persons employed in scheduled processes in all factories in which non-conforming glazes are used. The provision of fans has been extended to include ware cleaning, but exemption is offered on the score of using low solubility (5 per cent.) glaze, or of cleaning whilst the glaze is moist. The systematic daily sweeping of floors is still required, and the primary responsibility is now placed on the occupier of the factory. Exemption from the rules which aim at the prevention of lead poisoning is offered to manufacturers who give an undertaking to use "leadless" glaze only.

The minuteness of detail contained in these rules indicates the advances which have been made during the last decade in matters concerning the hygienic conditions of employment in dangerous occupations.

As regards Rules 1 and 2, which were really the main points at issue, it seems that the umpire by his award has cancelled the first, which prohibited the use of other than fritted lead in certain departments and processes. In the case of Rule 2, the 2 per cent. solubility proposed by the Home Office in January, 1901, has been modified to 5 per cent., or, as an alternative, the occupier may adopt the scheme of compensation prescribed in the schedule to the rules, which arranges for the payment of a certain sum to dependants in case of death, or of a weekly allowance during incapacity from lead poisoning.

objection by workmen against needlessly unwholesome conditions of labour: "He cannot exact his sanitary rights. He could not do so unless he were one in a combination of claimants; nor even then unless, further, he had sufficient knowledge to shape demands for definite remedies. These conditions do not seem in any degree likely to be realised." "Fourth Report of Medical Officer of Privy Council," 1862, p. 29.

⁵⁷ The minutes of these proceedings, and the rules, appear in the "Staffordshire Sentinel" for the dates mentioned.

Mortality of Pottery Workers.

The inquiry carried out by Dr. Headlam Greenhow in 1858 and 1860 established the fact that the mortality from pulmonary diseases in the Potteries district was exceedingly high compared with the normal rate at that period. He reported:—⁵⁸

“This class of operatives (potters) has, therefore, suffered a much larger mortality from these diseases, in proportion to its numbers, than the rest of the population, and may therefore be presumed to be exposed to some causes productive of pulmonary disease from which the rest of the population are exempt.”

Four years later, when the protective clauses of the Factory Acts were first extended to women, young persons, and children employed in the potteries, Dr. Arlidge published the small pamphlet to which I have already referred. The comparisons he made left no room for doubt as to the harmful nature of the potter's calling.

The figures given by Dr. Arlidge⁵⁹ approximately indicate the vital conditions among the male operative potters obtaining when the Factory Acts were initiated. Dr. Greenhow had previously shown that pulmonary affections were equally fatal among the female operatives, and the experience of Dr. Arlidge led him to the same conclusions.⁶⁰

Eleven years later Dr. Farr, in referring to this industry, stated:—

“The earthenware manufacture is one of the unhealthiest trades in the country. At the age of joining it is low, but the mortality after the age of 35 approaches double the average; it is excessively high, it exceeds the mortality of publicans.”⁶¹

After the expiration of another decade, Dr. Ogle's report concerning this industry was still less favourable. In reference to the above statement he said: “The death-rates on which that statement was based were exceedingly high, and since the statement was made, the rates have increased at each of the two age-periods, and give now a comparative mortality figure of no less than 1,742 (all males = 1,000), which is only exceeded in the table by the figures for costermongers, Cornish miners, and inn and hotel servants. This excessive mortality is in greatest part due to phthisis and diseases of the respiratory organs, the deaths from these two causes being represented by 1,118, while the number for all males is only 402; so that the mortality under

⁵⁸ “Third Report of the Medical Officer of the Privy Council,” 1860, p. 103.

⁵⁹ “Diseases of Occupations.” By J. T. Arlidge, M.D., 1892, p. 318.

⁶⁰ *Ibid.*, p. 10.

⁶¹ “Supplement to the Thirty-fifth Annual Report of the Registrar-General,” 1875, p. lvi.

“ these two headings is almost three times as great in this industry
“ as among average males.”⁶²

Dr. Tatham's report, dealing with the decade 1881-90, shows no marked diminution in the death-rates. I cannot improve on Dr. Tatham's summing up:⁶³ “ At all age groups . . . the death-
“ rates of these workers are above the standard, and at the age-groups
“ 45—55 and 55—65 they are more than double the standard. The
“ comparative mortality figures of potters is enormous, it amounts
“ to 1,706 . . . compared with the standard figure for occupied
“ males, the mortality figure of potters at ages 25—65 is in excess
“ by 79 per cent. . . . *the mortality from all causes among manufacturers*
“ *of earthenware has scarcely altered since 1881.*”

The following figures show the “comparative mortality figure” for male potters as against other occupations.⁶⁴

*Comparative Mortality Figures of Males from 25 to 65 Years of Age
Engaged in Different Occupations.*

Occupation.	Comparative Mortality Figure.			
	Calculated on Four Age-Groups. 1890-92.	Calculated on Two Age-Groups. (Modified Mortality Figure.)		
		1890-92.	1880-82.	1860, 1861, and 1871.
All males	1,000	1,000	942	960
Occupied males	953	947	910	—
Males in selected healthy } districts	679	693	—	—
Fisherman	845	843	752	786
Labourer (agricultural dis- } tricts)	666	681	660	—
Potter (earthenware manu- } facture).....	1,706	1,639	1,638	1,390
Coal miner (Durham).....	774	753	822	—
„ (Staffordshire).....	952	930	874	—
Iron and steel manufacturers...	1,301	1,265	818	—

The death-rate at the different age-groups shows the rapid collapse of potters at the later period.

⁶² “ Supplement to the Forty-fifth Annual Report of the Registrar-General,” 1885, p. xlii.

⁶³ “ Supplement to Fifty-fifth Annual Report of the Registrar-General,” 1897, p. xxv.

⁶⁴ *Ibid.*, p. clxxiii.

Death-rates of Males Engaged in Different Occupations at the Age-Groups 25—45 and 45—65 during the Period 1890-92, the Period 1880-82, and the Years 1860, 1861, and 1871.

	Mean Annual Death-Rate per 1,000 Living.					
	Age 25—45.			Age 45—65.		
	1890-92.	1880-82.	1860, 1861, and 1871.	1890-92.	1880-82.	1860, 1861, and 1871.
All males	9·99	10·16	11·27	28·30	25·27	23·98
Occupied males	9·52	9·71	—	26·69	24·63	—
Males in selected healthy } districts	7·09	—	—	19·30	—	—
Fisherman	9·75	8·32	11·26	21·34	19·74	15·84
Labourer (agricultural } districts)	7·10	7·13	—	18·74	17·68	—
Potter (earthenware } manufacturer)	12·98	13·70	12·59	52·78	51·39	41·75
Coal miner (Durham)	6·60	7·79	—	23·07	24·04	—
„ (Staffordshire)	7·19	7·81	—	30·28	26·50	—

The death-rates from different causes show the excessive mortality from phthisis and other diseases of the lungs.

Mortality Figures of Males, 25—65 Years of Age, in certain Specified Occupations, 1880-82 and 1890-92.

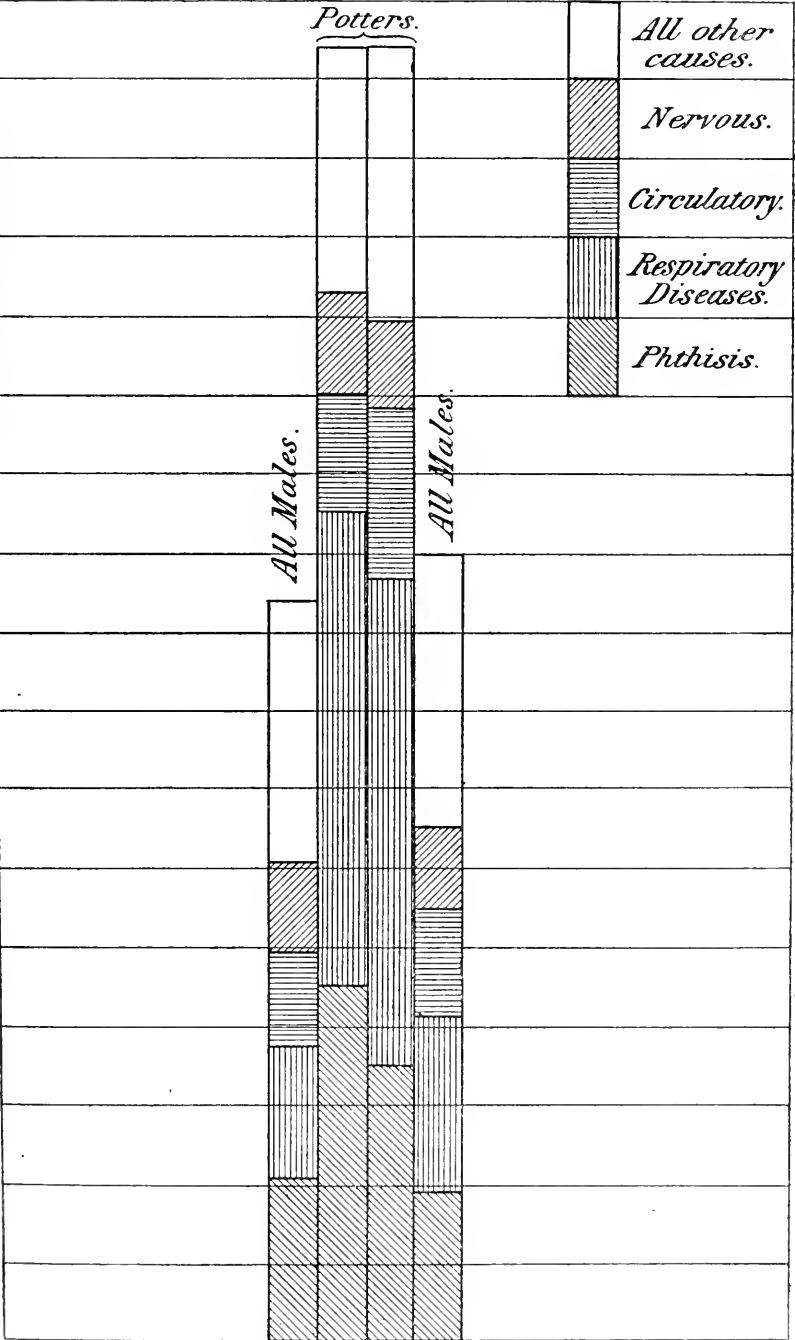
Occupation.		All Causes.	Phthisis.	Diseases of Respiratory System.	Diseases of Circulatory System.	Diseases of Nervous System.
All males	1880-82	942	208	171	113	102
	'90-92	1,000	192	224	132	192
Labourer, agricultural district	'80-82	660	115	147	92	76
	'90-92	681	118	134	103	62
Fishermen	'80-82	752	102	84	144	76
	'90-92	843	117	122	127	85
Potter, earthenware, &c., manufacture	'80-82	1,638	444	606	151	132
	'90-92	1,639	352	618	213	112
Coal miner (Staffordshire)	'80-82	874	96	245	98	76
	'90-92	930	87	298	125	62

Occupation.		Diseases of Liver.	Other Diseases of Digestive System.	Diseases of Urinary System.	Plumbism.	All Other Causes.
All males	1880-82	37	36	39	1	225
	'90-92	29	29	44	1	247
Labourer, agricultural district	'80-82	19	41	20	—	150
	'90-92	15	22	25	—	202
Fishermen	'80-82	30	33	14	—	269
	'90-92	23	32	27	—	310
Potter, earthenware, &c., manufacture	'80-82	46	32	46	9	172
	'90-92	32	29	59	18	206
Coal miner (Staffordshire)	'80-82	19	26	36	—	278
	'90-92	8	19	34	—	297

The following chart is based on the foregoing table:—

Chart showing Mortality of Males, 25 to 65 Years of Age, from Different Causes in Potters and all Males, 1880-82 and 1890-92.

Mortality
figure.
1,700



It should be clearly understood that the above facts concerning potters, admittedly serious enough, only refer to "half the case." According to the latest return,⁶⁵ 78,218 males and 55,222 females were employed in the earthenware works of the United Kingdom in 1898-99. In a great measure this large number of females are exposed to the same pernicious influences as are the males, and *à priori* we may take it that at least they suffer to the same extent. Unfortunately the occupational vital statistics in the report of the Registrar-General throws no direct light on the effect of employment on the health of females. But in 1898 an invaluable inquiry was prosecuted by Miss Paterson and Miss Deane, two of H.M. Lady Inspectors of Factories, concerning the mortality of female china scourers in Longton. This inquiry took place nearly four years after the establishment of the special rule which required occupiers to use, as far as practicable, in the process of china scouring, "mechanical or other efficient means for the removal of "dust."

The following table gives the numerical result of their observations:—⁶⁶

Female population in Longton (age period 15 to 70 years), taken at census of 1891 = 10,561.

Population of china scourers in Longton (age period 15 to 70 years), taken in 1898 = 160.

Number of Deaths from Respiratory Diseases and Phthisis.			Total Death-Rate per 1,000 per Annum.		
Date.	Among Total Population (as given above).	Among China Scourers.	Date.	Among Total Population (as given above).	Among China Scourers.
1	2	3	4	5	6
1896	45	12	1896	4.261	75.0
'97	49	11	'97	4.640	68.965
'98 (Jan. to June)	29	6	'98	5.492	75.0

N.B.—It has not been possible to trace the occupation of eight females out of the total number who died during these years; they therefore appear in the death total in column 2.

The co-signatories added: "The figures given speak for themselves, and require little comment; it will be seen that the "death-rate from phthisis, &c., among scourers is about fifteen "times as great as it is among women who, apart from occupation, "are for the most part exposed to exactly the same conditions."

It would seem that the effect of the efforts directed to the amelioration of the conditions of the workers in certain pottery

⁶⁵ "Supplement to Annual Report of Chief Inspector of Factories." Cd. 841, 1901, p. 29.

⁶⁶ "Annual Report of the Chief Inspector of Factories," for 1899, p. 300.

processes, especially those in which lead and dust are the injurious elements, is not sufficiently pronounced to be apparent in the general vital statistics of these operatives.

At first sight this statement may appear rather pessimistic, but it should be remembered that the persons deriving benefit from the operation of the special rules form only a small proportion of the total number of persons employed in "earthenware works."

On considering the mortality from lead poisoning alone, however, the effect of the special rules is much more apparent, as shown by "the number of fatal cases in which lead poisoning contracted in earthenware and china works was stated to have been directly or indirectly the cause of death."⁶⁷

Year.	1899.	1900.	1901.	1902.	1903.
Fatal cases	16	8	5	4	3

Sickness Experience of Pottery Operatives.

The Pottery Committee of 1893, in addition to other matters, made inquiry as to the amount of sickness among pottery workers, and they obtained particulars as to the sickness experience of the members ("who are very numerous, and, for the most part, dwellers in the Potteries") of the North Staffordshire Provident Society, the secretary of which supplied the following table:—⁶⁸

Year.	Total Paying Members.	Total Sick from Lead.	Total Sickness in Weeks.	Total Lead Sickness in Weeks.	Percentage of Lead Cases to Total Weeks.	Percentage of Lead Cases to Total Number of Members.
1864...	579	9	856	—	—	1·55
'65...	594	10	907	—	—	1·68
'66...	665	8	883	—	—	1·20
'78...	1,417	14	2,098	—	—	0·98
'81...	1,534	23	2,914	—	—	1·49
'83...	1,688	31	2,970	—	—	1·83
'84...	1,753	22	3,099	—	—	1·25
'85...	1,838	13	3,145	—	—	0·70
'86...	1,953	3	3,419	34	0·99	0·15
'87...	2,038	19	3,962	138	3·48	0·93
'88...	2,206	25	4,212	154	3·65	1·13
'89...	2,415	35	4,287	188	4·38	1·03
'90...	2,606	22	5,241	50	0·95	0·84
'91...	2,828	19	5,271	62	1·17	0·60
'92...	3,000	17	6,510	93	1·42	0·56

Note.—This table shows that so far as this society is concerned there has been a steady annual increase in the number of members, a much larger progressive decrease in the number suffering from lead poisoning, and during the last eight years no death ascribed to it.

⁶⁷ "Lead Poisoning in Earthenware and China Works." Parliamentary Return 103, 7th March, 1904, p. 6.

⁶⁸ "Potteries Committee of Inquiry," 1893, p. 6.

The Committee add: "The general outcome of these tables is, "that there is less prevalence of plumbism among the pottery "population than in past times, and this notwithstanding a "growing number of factories and workshops."

The return shows that for the last seven years the average sickness in weeks per annum, per member sick from lead, equals 5·1, which is moderately high. In addition, the "ordinary "sickness" rate per annum averages about two weeks per paying member, which is higher than the rates given in the table on page 458. This excess, I find, agrees with the high rate of sickness experienced by the members of the Ancient Order of Foresters in the Potteries district. The following figures are calculated on the returns of ten Courts in North Staffordshire and six Courts in Kent;⁶⁹ the latter represent a non-manufacturing district.

	1880.		1891.	
	Potteries.	Kent.	Potteries.	Kent.
Number of adult benefit } members }	1,837	1,108	1,829	1,581
Adult average age }	37·2	32·7	38·7	32·9
Adult members days' sickness	31,988	6,831	37,959	13,451
Average days' sickness per } member per annum }	17·4	6·1	20·7	8·5
Average days' sickness per } member per annum, Eng- } land }	9·45		12·04	

	1901.		1903.	
	Potteries.	Kent.	Potteries.	Kent.
Number of adult benefit } members }	1,740	1,919	1,652	1,961
Adult average age }	39·3	36·4	39·8	37·5
Adult members days' sickness	37,550	16,398	39,274	17,845
Average days' sickness per } member per annum }	21·5	8·5	23·7	9·1
Average days' sickness per } member per annum, Eng- } land }	12·83		13·57	

⁶⁹ "Directory of the Ancient Order of Foresters." The official numbers of the Courts in Staffordshire are 1,558, 548, 664, 723, 811, 828, 851, 853, 1,131, 1,412, in Kent. 3,898, 5,549, 3,712, 3,169, 4,318, 1,902.

There is nothing to show what proportion of the members of this Society in the Potteries District are potters, probably they are in the majority. If that is so, it would seem that whatever the special rules may have done to reduce the dangers which beset the potter, there are other causes at work which completely veil those benefits, so far as improvement would appear in a diminution in the sickness-rates referred to. This hypothesis may or may not be sound, but I give the figures for what they are worth.

Turning to the official returns concerning lead poisoning, however great benefits to the workers in the shape of lessened incidence of lead poisoning resulting from the enforcement of the hygienic clauses of the special rules are unmistakably evident. The following figures show the reduction in the aggregate sickness from lead poisoning for the years 1896-1904 (31st May).⁷⁰

Total Reported Cases of Lead Poisoning in Earthenware and China Works,
1896-1904.

1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904. (Five Months).
432	446	457	249	200	106	87	97	53

The figures prove beyond dispute the benefits accruing to the operatives in the dangerous processes from the sanitary regulations imposed on occupiers and workpeople. The improvement, of course, has not been uniform in all processes. The immediate benefits resulting from the use of fans in a process in which lead dust is diffused is exemplified in the case of ground-laying. The special rules of May, 1898, required fans or other means for the removal of dust in this process, and the resulting reduction in the number of cases of lead poisoning is shown in the following table. This table also shows the number of cases of lead poisoning in the potteries districts for the years 1898-1903 :—⁷¹

⁷⁰ "Annual Reports of the Chief Inspector of Factories," and the "Labour Gazette."

⁷¹ "Lead Poisoning in Earthenware and China Works." Parliamentary Return 103, 1904, p. 4.

North Staffordshire Potteries District. Number of Reported Cases, Number of Persons Employed, and Proportion of Cases to Persons Employed in the various Processes in China and Earthenware Works.

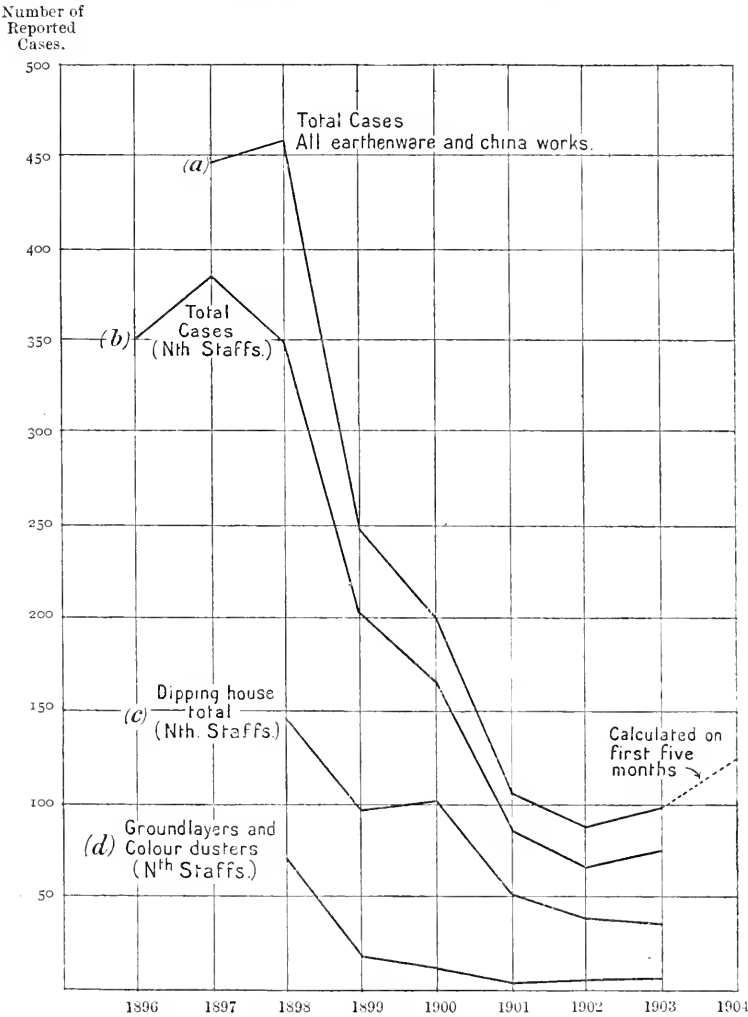
Processes in which Persons Employed.	Number of Persons Employed in 1903.	Number of Cases reported as occurring in					Proportion of Cases to Persons Employed.				
		1903.	1902.	1901.	1900.	1899.	1898.*	1903.	1902.	1901.	1900.
								Per cent.	Per cent.	Per cent.	Per cent.
In dipping house—											
Dippers	501	10	5	12	30	30	41	2.0	1.0	2.4	6.0
Dippers' assistants	63	1	1	1	3	7	7	1.6	1.6	1.6	4.8
Ware cleaners	209	14	9	10	15	16	20	1.3	0.8	4.8	7.2
	414	2	2	1	6	3	1	2.5	2.5	1.2	7.4
		13	19	22	39	29	58	3.1	4.6	5.3	9.4
Total in dipping house	608	17	10	17	44	43	62	1.8	1.0	1.8	4.5
	686	28	29	33	57	52	84	4.1	4.2	4.8	8.3
Glost plaicers	1,821	9	12	19	28	53	48	0.5	0.7	1.0	1.5
Majolica painters	55	—	1	—	—	1	1	—	1.8	—	—
Ground layers	425	10	3	3	4	20	31	2.4	0.7	0.7	0.9
	48	1	—	1	1	2	10	2.1	—	2.1	2.1
	287	2	4	—	6	8	45	0.7	1.4	—	2.4
Colour dusters	2	3	1	2	5	8	—	—	—	—	—
Enamel colour and glaze blowers	18	—	1	—	1	1	—	—	—	—	—
Colour makers and glaze millers and mixers	200	3	3	5	4	6	32	1.4	0.7	1.3	2.6
Other persons in contact with lead	68	—	1	—	1	—	35	—	33.3	2.4	1.9
	15	2	—	2	3	5	—	—	1.5	—	33.3
					7	4	—	13.3	—	13.3	40.7
Grand total	3,134	30	26	42	81	110	152	1.0	0.8	1.3	2.6
	1,723	45	40	42	84	94	196	2.6	2.3	2.4	4.9
	4,857	75	66	84	165	204	348	1.5	1.4	1.7	3.4

* The percentages for the year 1898 are calculated on a return of persons employed in that year and not on the number given in the Table. (See Report by Professor Thorpe and Dr. Oliver on the Employment of Lead Compounds in the Manufacture of Pottery.—Parliamentary Papers [C-9207], 1899, p. 9.)

The following Chart expresses the same facts :—

Chart showing the Relative Diminution in the Number of Cases of Lead Poisoning among Persons Employed in—

- (a.) *All Earthenware and China Works ;*
- (b.) *Earthenware and China Works in Potteries District ;*
- (c.) *Dipping-house (Total) ; and*
- (d.) *Ground-laying and Colour Dusting Combined.*



Whereas nearly 20 per cent. of the total cases reported among females in 1898 were ground-layers, the proportion had fallen to about 8 per cent. in 1899, and about 4 per cent. in 1903. No cases were reported among this class of operatives in 1901. The process of colour dusting also shows a diminution from the same cause.

It would be idle for me to attempt to estimate the benefits arising from the special rule which requires a periodic medical examination of the workers in dangerous processes, which since 1898 has been a condition of employment in such processes. At first it related to women and young persons only, but under the recent Award Rules of Lord James this admittedly beneficial clause has been extended to include, under certain conditions, male adults. The examining surgeon has power to suspend a worker from employment in lead processes; by this means susceptible persons may be removed from the dangerous influence of lead.

The following table⁷² shows the number of persons suspended by the Certifying Surgeons in the Potteries district during the years 1899-1903.

Number of Persons Suspended by the Certifying Surgeons for the Hanley, Burslem, Tunstall, and Stoke Districts from Working in Dangerous Processes in which such Persons were Employed.

Processes in which Persons Employed.	Number of Persons Suspended.				
	1903.	1902.	1901.	1900.	1899.
Dippers and dippers' assistants { M.	5	5	13	13	19
{ F.	30	14	24	29	10
Ware cleaners { M.	—	—	—	—	—
{ F.	26	25	11	20	34
Glost placers { M.	—	—	1	2	—
{ F.	1	—	1	—	—
Majolica painters { M.	—	—	—	—	—
{ F.	19	11	10	8	26
Ground-layers { M.	1	—	—	—	—
{ F.	4	3	4	6	14
Colour dusters { M.	—	—	—	—	—
{ F.	6	6	11	12	10
Enamel colour and glaze blowers { M.	—	—	—	—	—
{ F.	6	3	5	4	2
Other persons in contact with lead { M.	—	—	—	—	1
{ F.	1	1	2	—	7
Total { M.	6	5	14	15	20
{ F.	93	63	68	79	103
Total M. and F.	99	68	82	94	123

⁷² "Lead Poisoning in Earthenware and China Works." Parliamentary Return 103, 1904, p. 8.

It will be noticed that a smaller number of suspensions took place in 1902 as compared with 1899, but against that there has been a marked increase in 1903; it seems difficult to account for this increase, which may be a temporary one only. Concerning the effect of the monthly examination, Dr. Legge writes,⁷³ "There can be no doubt that the monthly examination of women and young persons, which began in August, 1898, under the new rules, has been attended with good results . . . The measure therefore of the success attending the monthly examination is to be gauged rather by diminution in the number of severe cases than of the actual number reported."

The reduction in the number of severe cases is shown in the following table :—⁷⁴

Particulars as to Character of Reported Attacks in Earthenware and China Works.

Particulars of Attacks.	Number of Cases falling within Each Subdivision.				
	1903.	1902.	1901.	1900.	1899.
Severity of symptoms—					
Severe ... { M.	11	7	19	17	35
{ F.	13	3	10	25	22
Moderate { M.	17	9	7	15	16
{ F.	17	10	14	23	18
Slight { M.	14	24	26	53	62
{ F.	23	31	25	46	67
Not stated { M.	1	—	5	7	6
{ F.	1	3	—	11	4

Particulars of Attacks.	Proportion of Cases to Total.				
	1903.	1902.	1901.	1900.	1899.
Severity of symptoms—	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Severe ... { M.	25·6	17·5	33·3	18·5	29·4
{ F.	24·1	6·4	20·4	23·8	19·8
Moderate { M.	39·5	22·5	12·3	16·3	13·5
{ F.	31·5	21·3	28·6	21·9	16·2
Slight { M.	32·6	60·0	45·6	57·6	52·1
{ F.	42·6	66·0	51·0	43·8	60·4
Not stated { M.	2·3	—	8·8	7·6	5·0
{ F.	1·9	6·4	—	10·5	3·6

⁷³ "Annual Report of Chief Inspector of Factories," 1898, p. 109.

⁷⁴ "Lead Poisoning in Earthenware and China Works." Parliamentary Return 103, 1904, p. 6.

The figures for *severe* cases for 1902 are considerably less than those for 1899, although the numbers increased again in 1903.

Physique of Pottery Operatives.

The exhaustive inquiries carried out by Dr. Greenhow afforded him the opportunity of comparing the general physique of one class of operatives with that of others. In reference to potters he said,⁷⁵ "the potters of Stoke and Wolstanton are of short stature " and sickly appearance . . . It was stated by Mr. Boothroyd, a " medical practitioner at Hanley, that each successive generation " of potters becomes more dwarfed and less robust than the " preceding one, and that, in his opinion, but for their occasional " intermarriage with strangers this deterioration would proceed " even more rapidly."

These statements, it will be observed, refer to the state of the potters prior to the introduction of protective legislation. After nearly thirty years of regulation, but before the days of obligatory special rules, Dr. Arlidge wrote more favourably respecting these workers.⁷⁶

Similarly, after nearly ten years of progressive sanitation under special rules and its contemporaneous agitation, we may *à fortiori* assume that improvement, or at least a retardation of deterioration in the physique of pottery workers has resulted.

Lucifer Match Manufacture.

The manufacture of lucifer matches seems to have been introduced into this country a few years before Queen Victoria ascended the Throne. It gradually grew in importance, until in 1860 there were nearly 3,000 workers engaged in this industry. The admirable report of Dr. Bristowe (see Fifth Report of the Medical Officer of the Privy Council), dated 1864, is in itself a complete and exhaustive account of the conditions of the workers engaged in the manufacture of lucifer matches at that period.

The condition of these workers was described by Mr. H. A. Bruce in moving the second reading of the Factories Bill of 1864; summing up the report of Dr. Bristowe and the evidence⁷⁷ taken before the Commissioners, he said:⁷⁸ "These children and young " persons, about 1,800 in number . . . were the most neglected " and worst educated of any class, and that they were the poorest

⁷⁵ "Third Report of the Medical Officer of the Privy Council," 1860, p. 104.

⁷⁶ "Diseases of Occupations." By J. T. Arlidge, M.D., 1902, p. 35.

⁷⁷ "Report of Commissioners on Employment of Children." House of Commons Papers, 1863, XVIII.

⁷⁸ "Hansard," 14th June, 1864.

"of the poor and the lowest of the low. They often lost portions of the jaw, and in some cases the lower jaw was entirely destroyed. The effect of attention having been directed to the matter had been to diminish the evil, but still the application of the Bill would be of the greatest use . . . in securing ventilation, and preventing the children having their meals where they would still inhale the fumes of phosphorus."

The Act of 1864 also prohibited the taking of meals by women, young persons, or children "in any part of the factory where any manufacturing process (except that of cutting the wood) is usually carried on."

Then followed the Act of 1878, which prohibited the employment of children "in any part of a factory or workshop in which there is carried on the dipping of lucifer matches;" and in June, 1892,⁷⁹ the "manufacture of lucifer matches, except such as are made of red or amorphous phosphorus," was certified by the Secretary of State as a dangerous process. In the same year special rules were established in all lucifer match factories using white or yellow phosphorus. The principal requirements of the amended special rules which were duly established were: "Efficient means, both natural and mechanical, for thorough ventilation in the mixing, dipping, drying, and boxing departments; effectual means to prevent the fumes from the before-mentioned processes from entering the rest of the factory;" and that those processes should be carried on in "an apartment or apartments separate from other portions of the factory; the provision of washing conveniences, with a sufficient supply of hot and cold water, soap, nail brushes and towels," to be used before meals and before leaving the works. The rules further required a monthly examination of the workers by the certifying surgeon, who had power to order temporary or permanent suspension of any worker showing symptoms of incipient necrosis. Re-employment was not permitted without a medical certificate of fitness. Notification by the occupier of every case of necrosis was obligatory under these rules, thus anticipating the compulsory notification required by section 29 of the Act of 1895. Since about 1876 great advances had been made in continental countries in the control of lucifer match factories; and in May, 1898, Professor Thorpe and Professor Oliver, and soon afterwards Dr. Cunningham, were requested by the Secretary of State to investigate the conditions of employment in this industry.⁸⁰ Their reports were published in 1899. They gave conclusive evidence that necrosis of the jaw ("phossy jaw") arises from

⁷⁹ "Annual Report of the Chief Inspector of Factories," 1892, p. 32.

⁸⁰ *Ibid.*, 1898, p. 128.

exposure to the action of white or yellow phosphorus, but that the use of an allotropic modification of the element, known as red or amorphous phosphorus, was strikingly free from risk. The reports also showed that phosphorus poisoning in lucifer match factories is a chronic process, the acute form being seldom met with.

Their most pressing recommendations were the adoption of more stringent hygienic precautions than were hitherto in force, aiming at (*a*) the more complete separation of the dangerous processes, (*b*) the efficient general mechanical ventilation of workrooms where dangerous processes were carried on, (*c*) local mechanical ventilation of dipping slabs and boxing benches, (*d*) more suitable washing conveniences, (*e*) the wearing of overalls, (*f*) the provision of an antiseptic mouth wash, (*g*) systematic medical and dental inspection of the workpeople.

On the strength of this report revised special rules were drafted and issued to the occupiers concerned. Some occupiers objected to the new draft, and arbitration became necessary. The award of the arbitrator "introduced certain modifications, the effect of which was to make the rules somewhat less stringent than had been proposed, but still far in advance of those previously in force."¹ No further extension or modification of the rules has taken place since March, 1900, hence the code as then settled is now in force.

In considering the effect of the successive measures briefly surveyed above, it is not possible to follow the usual procedure adopted in this paper, owing to the comparatively small number of persons employed (in 1898-99 there were only 4,216 persons employed in this industry throughout the United Kingdom);² consequently the effect can only be shown statistically by means of the figures relating to the cases of phosphorus necrosis among the workpeople employed in the factories.

Particulars are given below as to the number of persons employed in match works in the year 1897, the number exposed to risk of phosphorus poisoning, and a summary of the cases for the five years 1894-98³:—

¹ "Annual Report of the Chief Inspector of Factories," 1900, p. 9.

² "Supplement to the Annual Report of Chief Inspector of Factories," 1900, p. 33.

³ Report on the use of Phosphorus in the Manufacture of Lucifer Matches. Cd-9188, 1899.

Number of Persons Employed in Match Works in 1897, and the Number of Persons Exposed to Risk of Phosphorus Poisoning in 1897-98.

Class of Persons.	Male.	Female.	Total.
Adults (over 18)	643	2,015	2,658
Young persons	425	1,067	1,492
Children	2	—	2
All ages	1,070	3,032	4,152*
Process—			
Mixing, dipping, drying	237	21	258
Boxing	8	1,255	1,263
All phosphorus processes	245	1,276	1,521
Non-phosphorus processes	—	—	1,613
Total	—	—	3,134†

* These figures relate to 25 match works.

† " " 23 "

“In the five years 1894-98 which have elapsed since the rules became established, 36 cases of necrosis have become known; 16 of these were in males, and 20 in females. Although the males employed are fewer in number, they are engaged in processes (mixing and dipping) which would seem to entail more danger than boxing; but it is very probable that the more permanent character of the men’s employment adds materially to their share of necrosis.”

Recorded Cases of Phosphorus Necrosis in Match Factories in the United Kingdom in the Five Years 1894-98.

	Mixing, Dipping, and Drying.	Boxing.	Total.
Male	13	3	16
Female	—	20	20
Total	13	23	36

“Three of the above cases are known to have ended fatally: all three were engaged in the dipping.”

Since 1898 a considerable diminution in the number of cases has taken place, as shown by the following figures, which have been extracted from the Annual Reports of the Chief Inspector of Factories:—

Reported Cases of Phosphorus Necrosis.

	1899.	1900.	1901.	1902.	1903.
Males	4	1	3	1	—
Females	4*	2	1	—	—
Total	8	3	4	1	—

* Includes one death.

There appears to be some doubt as to the number of cases prior to 1898. In his annual report for 1899, H.M. Medical Inspector of Factories says:⁸⁴ "The total cases within the last twenty years of " which there is definite record number 102; of the total, 102 " cases, 19 terminated fatally."

In regard to the returns since 1898, however, there is no doubt as to their accuracy, and they present irrefutable proof of the beneficial effects of the special regulations which have been enforced for improving the hygienic conditions under which the manufacture of phosphorus matches is carried on.

The possibility of freeing this industry from its gravest danger was clearly in the mind of H.M. Chief Inspector of Factories when, in 1899, he wrote:⁸⁵ "With due selection of workpeople, " strict medical and dental supervision, proper structural and " administrative conditions, and substitution of machinery for " hand labour in the phosphorus processes, it seems that the " dangers hitherto attending the use of yellow phosphorus can be " overcome." It would seem that that end has been attained.

Manufacture of White Lead.

White lead factories were nominally within the scope of the Act of 1867, but this industry does not appear to have been subjected to any special attention or restrictions at that time. The Commissioners of 1876,⁸⁶ however, called attention to the injurious effects of employment in the making of white lead, and the necessity of more stringent sanitary control than was exercised in the case of ordinary factories. As the result of their recommendations the first statutory regulation specially directed to employment in the manufacture of white lead was embodied in the Act of 1878.

⁸⁴ "Annual Report of Chief Inspector of Factories," 1899, p. 318.⁸⁵ "Report on the use of Phosphorus in the Manufacture of Lucifer Matches," 1899, p. viii.⁸⁶ "Report of the Commissioners, Factories and Workshops," 1876. House of Commons, pp. xxix, and xxx.

Section 38 of that Act prohibited the employment of a child or young person "in a part of a factory or workshop in which there "is carried on the process of making white lead."

In 1882 Mr. A. Redgrave presented a valuable report,⁸⁷ in which he showed this to be one of the most pernicious of lead industries. Then followed the Act of 1883, and with it the first serious attempt to impose obligatory regulations in the more dangerous occupations. Under this Act every white lead factory was required to be duly certified as conforming to certain scheduled conditions. It gave power to the Secretary of State "to revoke, "alter, add to, or modify" in writing, "all or any of the conditions "specified in the schedule." The gist of the scheduled conditions appears below:—

- (1.) Efficient ventilation of stacks and stoves;
- (2.) Provision of sufficient washing accommodation;
- (3.) Provision of baths for use of the women;
- (4.) Provision of "a proper room for meals" (but not in any part of the factory where any work is carried on);
- (5.) Provision of overalls, head coverings, and respirators for persons employed in certain processes; and
- (6.) A sufficient supply of acidulated drink.

The experience of a few years in the administration of this Act, however, clearly indicated its weaknesses. Unfavourable reports relating to this industry were submitted by H.M. Inspectors of Factories, and on 9th May, 1892, the manufacture of white lead was certified as dangerous, and revised special rules were issued. These rules followed somewhat on the lines of the regulations of 1883, but protection was extended to men and women alike. Here was introduced the systematic weekly medical examination of each individual worker, and special ventilation was required in specified departments. During this year a special investigation into the conditions obtaining in white lead works was made for the Royal Commission on Labour by one of the Lady Sub-Commissioners, who reported,⁸⁸ "a considerable number of women and girls are "affected by lead poisoning after having worked but a few months "or weeks, and some of them die within two or three days in a "state of coma."

Attention was again directed to this industry in 1893. After full inquiry, the Departmental Committee⁸⁹ made several important recommendations with a view to further strengthening the special

⁸⁷ "Report on the Manufacture of White Lead." By Alexander Redgrave, Esq., C.B., 1882.

⁸⁸ "Royal Commission on Labour," Appendix III, p. 517.

⁸⁹ "Departmental Committee on various Lead Industries." C-7239, 1893.

rules of 1892. They pointed out the necessity for efficient ventilation, and recommended "that the packing and storing of "dry white lead shall not be carried on except under a hood "connected with a fan or other device for creating a draught, "whereby the dust shall be carried away." They also recommended the provision of a standpipe or hose, with a sufficient supply of water, for damping the white beds previous to stripping.

An immediate revision of the special rules took place. The new code, which was founded on the recommendations of the Committee and of the Lady Sub-Commissioner (Royal Commission on Labour), was a great advance on the previous rules, but in June, 1898,⁹⁰ it was deemed necessary to substitute male for female labour in the dangerous processes; and in 1899⁹¹ "it was found necessary to "increase the stringency of the special rules of 1894. This was "done, after conference with the manufacturers, in June, 1899. "Amended rules, some of which entail important structural "alterations, were established in the works in which white lead is "manufactured."

This code (which is still in force) consists of thirty-five rules, in which are embodied the recommendations and suggestions which had from time to time been made by different members of the inspectorate. These rules represent the experience of skilled observers in the hygienic control of lead industries generally, of which the manufacture of white lead is, perhaps, one of the most important. The previous codes, although excellent so far as they went, did not really strike at the root of the evil, viz., the prevention of dust. As to this, H.M. Medical Inspector reported in 1898,⁹² "I consider the most urgent remedial measure in white "lead works is to require that no packing of dry white lead shall "be done without the use of exhaust fans." . . . "Next to "packing comes stoving as a source of danger."

The whole tenor of these rules is towards sanitary efficiency in all processes in which the workers are exposed to risk by the inhalation of the dust of this useful, but at the same time deadly, compound.

Mortality of Lead Workers.

The term "lead worker" used in the mortality statistics issued by the Registrar-General is not limited to persons employed in the manufacture of white lead, but it would seem that the latter class predominate in the returns under that head. The Census return for

⁹⁰ "Annual Report of Chief Inspector of Factories," 1898, p. 120.

⁹¹ *Ibid.*, 1899, p. 9.

⁹² *Ibid.*, part II, p. 120.

1891 gives 2,072 lead workers, and the Factory Department returns for 1898-99 account for 1,933 males employed in white, red, orange, and yellow lead works; 1,707 of the latter are included under the head of white lead. Hence mortality statistics relating to white lead workers may be taken as being approximately equivalent to those given for "lead workers." Owing to the comparatively small number of persons employed in the industry under review, the mortality returns issued prior to the supplement to the fifty-fifth report of the Registrar-General give no details as to the causes of death among these workers. In the years 1860-61 87 deaths of males over 15 years of age are recorded⁹³ under the head "lead manufacture." In the same group 55 deaths are recorded for the year 1871;⁹⁴ this is an increase on the average of the two years 1860-61, and is probably to be accounted for by the development of the manufacture. Particulars in the next decennial supplement are even more scanty, and lead workers are lumped together with copper, zinc, and brass, &c., workers; but 8 deaths from lead poisoning alone are recorded for the four years (1879-82) among lead (? white lead) workers.⁹⁵ Much fuller information, however, is given in the decennial supplement issued in 1897. In Dr. Tatham's summary he says:⁹⁶ "The deaths among lead workers in the three years 1890-92 amounted to 196, a number which is far too small to form a safe basis for the calculation of detailed rates of mortality. Nevertheless, having regard to the well known unhealthiness of this occupation, it will be prudent to examine the general teaching of the figures. The comparative mortality figure for lead workers at ages 25—65, amounts to not less than 1,783, or 87 per cent. above that for occupied males. Of the total deaths among lead workers at these ages about one-third part are from pulmonary disease, *i.e.*, from phthisis and other diseases of the lungs taken together, and one-eighth part are from lead poisoning."

The death-rates at different age-groups of lead workers are far in excess of the death-rates for occupied males, and also exceeds the notoriously high death-rates for file cutters, except at the two groups 35 and 45, as shown below :—

⁹³ "Supplement to Twenty-fifth Annual Report of the Registrar-General," 1864, p. 449.

⁹⁴ "Supplement to Thirty-fifth Annual Report of the Registrar-General," 1875, p. 456.

⁹⁵ "Supplement to Forty-fifth Annual Report of the Registrar-General," 1885, p. lxiii.

⁹⁶ "Supplement to Fifty-fifth Annual Report of the Registrar-General," 1897, p. liv.

	Age Groups.						
	15—	20—	25—	35—	45—	55—	65 and Upwards.
Occupied males	100	100	100	100	100	100	100
Metal worker	105	103	106	111	122	129	128
File maker	65	131	152	210	194	193	144
Lead worker	174	232	167	183	182	205	275

The lead workers' mortality for "plumbism" is exceedingly high, being nearly three times as high as that for file makers, the next highest; see following table:—

	Plumbism.	Diseases of Urinary System.	Diseases of Nervous System.	Phthisis.	Circulatory Diseases.	Respiratory Diseases.
Lead worker.....	211	161	232	148	272	397
File maker	75	104	212	402	204	423
Plumber	21	81	131	165	123	218
Potter	17	63	123	333	227	668
Lead miner	5	41	62	380	142	325
Occupied males	1	41	82	185	126	221

It will be observed that lead workers also experience a high mortality from diseases of the urinary and nervous systems.

The foregoing figures are not of much assistance in estimating the effect of legislation directed to the white lead industry, but taken in conjunction with the Home Office returns they help to throw light on the subject.

The Sickness Experience of White Lead Workers.

Previous to the compulsory notification of lead (and other) poisoning required by the Act of 1895, the records of sickness from this cause are very incomplete. The large number of cases in the Newcastle district, the centre of the industry, about 1882, seemed to have attracted notice. "The number of cases of lead poisoning in the district were so numerous, that the guardians of Gateshead protested against the heavy burden which was being imposed upon the ratepayers by the number of disabled persons thrown upon the rates. Now the universal testimony is that there has been a great improvement. The medical men in and about Newcastle, who have had special experience among lead workers, are unanimous in their opinion that the Act of 1883 has effected a beneficial change among them. The cases of sickness in all forms, and paralysis, blindness and death traceable to the same,

"are greatly reduced in number." So wrote Mr. Henderson, H.M. Superintending Inspector, in October, 1892.⁹⁷

The report⁹⁸ of the Lady Sub-Commissioner contains much information concerning the health of workers in the white lead factories: "Within five years 135 cases of lead poisoning were admitted into the Newcastle Infirmary, 94 women and 41 men; 8 of the patients died. The inquests held from 1889 to 1892 in the Newcastle district show 23 deaths attributed to lead poisoning; 22 women and 1 man . . . In the year 1891-92, 29 workers (of whom 27 were women) were suspended at one firm by the doctor's orders, out of a working staff of 30 people. At another firm 111 out of a staff 154 . . . were suspended." There was a consensus of opinion, however, "that great improvement has taken place since this industry was brought under the Factory Acts in 1883, which the recent addition of 'special rules' has accentuated."

In 1896 the Inspector for the Newcastle district reported:⁹⁹ "Last year 114 cases were reported, this year 80. This decrease is very remarkable, and I think genuine . . . I consider the improvement is due to the increased protection supplied by the special rules. Of these 80 cases of poisoning, 66 were women and 14 were men, 4 have been fatal."

Apart from the comparison given in the preceding paragraph, the returns relating to the numbers of cases of lead poisoning do not admit of a comparison between the attack rate at one period of legislation and that at a later period. Compulsory notification, however, was inaugurated in 1895, and from that year the Home Office records are available.

In 1898 H.M. Medical Inspector of Factories found¹⁰⁰ that employment in this industry was largely casual, and that the casual worker suffered from lead poisoning to a much greater extent than regular hands, as shown in the following figures:—

	Number of Factories.	Average Number Employed.	Number of Notifications, 1898.	Approximate Number passing through in the Year.
Regular employment	13	822	50	1,000
Casual ,,	9	641	250	3,000

⁹⁷ "Annual Report for Chief Inspector of Factories," 1892, p. 14.

⁹⁸ "Royal Commission on Labour, Employment of Women," App. III, p. 517.

⁹⁹ "Annual Report of Chief Inspector of Factories," 1896, p. 28.

¹⁰⁰ *Ibid.*, 1891, p. 119.

I have thought it necessary to refer to this subject of casual labour because this disturbing influence tends to vitiate the effects of the elaborate sanitary clauses before reviewed, and unless we have full cognisance of it, erroneous conclusions may be drawn from the figures relating to lead poisoning in this trade.

One effect of the substitution of male for female labour was the transference of the incidence of lead poisoning from the latter to the former sex, as shown by the following figures.¹⁰¹

	January.	February.	March.	April.	May.	June.
Males	14	22	13	14	18	21
Females	31	14	24	19	28	9
Totals	45	36	37	33	46	30

	July.	August.	September.	October.	November.	December.
Males	28	31	67	38	34	46
Females	9	5	1	2	1	1
Totals	37	36	68	40	35	47

The new rule relating to the construction of stoves did not come into operation until 1st January, 1901, but its effect in the reduction of the number of cases reported among persons employed in stoving is shown by the following figures relating to five factories :—¹⁰²

Number of Factory.	Cases of Lead Poisoning.	
	1898.	1901.
1	93	58
2	51	10
3	17	9
4	12	4
5	3	1
Totals	176	82

The total number of reported cases of plumbism from white lead works since January, 1896, is given below :—

¹⁰¹ "Dangerous Trades," by Thomas Oliver, M.A., M.D., 1902, p. 296.

¹⁰² "Annual Report of Chief Inspector of Factories," 1901, p. 216.

	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904. (Five Months).
Males	121	134	258	373	325	175	136	101	32
Females	118	236	74	26	33	14	7	8	3
Total	239	370	332	399	358	189	143	109	35

The figures need a little explanation. Ignoring the figures for 1896, which are probably incomplete, it will be noticed, on comparing 1898 with the preceding year, that whereas in 1897 the reported cases among females far outnumbered those for males, in 1898 the number of cases among males was more than three times the number of cases among females. This of course was the result of the substitution of male for female labour, to which reference has already been made. The number of cases for 1899 shows an increase of about 20 per cent. on the total for 1898; increased trade may probably account for this. During the next twelve months a slight diminution took place, but H.M. Medical Inspector states that out of the total, 358, 183 cases were reported from two works only, both of which gave employment to a large number of casual workers. He adds that in these two works great structural alterations were in progress during the year. The result of these alterations is apparent in the return for the following year, for the number of cases dropped to 58 and 16, and in 1902 the numbers were 43 and 7 respectively.¹⁰³ Mr. H. J. Wilson, H.M. Inspector for the Newcastle district, also refers to the improvements which were in hand in 1900:—¹⁰⁴

“The work of alteration of premises, stoves, &c., which is “without doubt a great undertaking, is now going on well, and the “work appears to be of a character to last.”

This gradual “levelling up” shows itself in the reduced numbers of cases of plumbism; the cases in 1901 are nearly 50 per cent. less than in the previous year. The improvement was continued in 1902, but rather less rapidly, and, in fact, has gone on from that time down to the end of May of the present year.

That the physical conditions under which the manufacture of white lead is carried on are all-important is shown by the following interesting report: ¹⁰⁵ “In consequence of special incidence of severe “lead poisoning in one factory, extensive structural improvements “were carried out, with the result that no subsequent notification “has been received.”

¹⁰³ “Annual Report of Chief Inspector of Factories,” 1901, p. 215.

¹⁰⁴ *Ibid.*, 1900, p. 271.

¹⁰⁵ *Ibid.*, 1902, p. 248.

Mines Regulation Acts.

"Never will I believe that what makes a population stronger, and healthier, and wiser, and better, can ultimately make it poorer."—

MACAULAY.

The first statute relating to employment in mines and collieries was not ratified until forty years of factory legislation had been experienced. The Act of 1842 came immediately on the heels of the Report of the Royal Commission on Labour in Mines, 1841. The deplorable conditions of the women, young persons, and children employed underground were revealed by that report. Comparing the lot of these poor creatures with that of children in the factories, Mr. Tufnell, in his evidence, said, "The hardest labour in the worst room, in the worst conducted factory, is less hard, less cruel, and less demoralising than the labour in the best coal mine." Mr. Scriven's report concerning employment in Yorkshire mines, which he called "dens of darkness,"¹⁰⁶ was to the same effect. To remedy these evils the Act of 1842 prohibited the employment of females, and of males under 10 years of age, below ground.

This Act contained no clauses regulating the hygienic conditions of the mines and collieries to which it related, although the Select Committee of 1835 had clearly stated that:¹⁰⁷ "the absolute necessity of greater attention to this point (ventilation) has been fully established." In 1850, however, systematic inspection, by the Government Inspectors, of the ventilation and mode of lighting or using lights in coal mines was secured by the Act of that year. Then followed the Act of 1855, which required adequate ventilation to dilute and render harmless noxious gases to such an extent as that working places and levels were, under ordinary circumstances, in a fit state for working. This Act, however, was to continue for five years only, but its provisions were rendered permanent by the Act of 1860, which applied to coal and ironstone mines. An Act passed two years later considerably strengthened the hands of the inspectors in matters concerning ventilation, by prohibiting the working of any seam in such mines unless in communication with two or more shafts, which were separated by not less than 10 feet of natural strata. In 1862 another Royal Commission was appointed, and their Report was issued in 1864. To give effect to their recommendations two Acts were passed in 1872: one to amend and consolidate the Acts relating to the regulation of coal and certain other mines, and the other to apply to all mines other than those

¹⁰⁶ "Royal Commission, Mines," Part II, p. 63.

¹⁰⁷ "Select Committee of House of Commons, Accidents in Mines, 1835," p. vi.

to which the Coal Mines Act applied. As regards the former it considerably strengthened the provisions of the Acts which it superseded. The more important new features were: provision for granting certificates of competency to mine managers, and for inspection of mines on behalf of the workmen; preliminary examination of workings by competent persons in cases where inflammable gas had been found within the preceding twelve months; withdrawal of men in case of danger; safety lamps to be examined in special place set apart for that purpose, and to be locked before being issued to men; precautionary measures concerning storage and use of explosives underground.

As regards the metalliferous mines (now for the first time regulated under a separate and distinct code, which has not yet been superseded by an amending Act) the regulations are somewhat similar to those for coal mines, but on the whole are less stringent. A certificated manager is not required, and special rules are not obligatory. Here, however, a dressing room, or "dry," is required if more than twelve persons are employed underground; there is nothing corresponding to this under the Coal Mines Act.

The Reports of H.M. Inspectors of Mines show that improvements in ventilating plant were being made in many places.

On the other hand, great laxity in the matter prevailed in some quarters, for Mr. Evans, H.M. Inspector of Mines, in his report for 1875, gives particulars of 22 underground colliery explosions in the Midland district. He states that no less than 14 of these explosions were directly due to insufficient ventilation. Mr. Wales's report on the explosion at the Glan Colliery in December, 1875, is in the same strain: "I consider this explosion, and consequent loss of life (16 deaths), is fairly attributable to "defective ventilation."

Although the Coal Mines Act of 1872 regulated the use and storage of explosives underground, an agitation was still proceeding against the use of gunpowder; that compound was naturally credited as being the primary cause of many explosions of fire damp. But the investigations of the Inspectors of Mines often proved that that idea was erroneous. A report¹⁰⁸ by Mr. Evans is typical of many: "The late deplorable explosions¹⁰⁹ of gas, which have resulted in "so great a sacrifice of human life, and have so properly excited "the public mind, have, in my opinion, resulted not from the use "of gunpowder, but from the violation of the first General Rule"

¹⁰⁸ "Mines Inspectors' Reports for 1876," p. 71.

¹⁰⁹ The Swaithes Main Disaster, in December, 1875, resulted in the death of 140 persons.

(which enacts that an adequate amount of ventilation shall be produced in every mine).

Forty years before these words were written the Select Committee of the House of Commons had pointed to "the absolute necessity of greater attention to this point." Apart from a few exceptions, however, the subject of ventilation and, its concomitant factors for the prevention of explosions—the safety lamp, "safety explosives," and mine discipline—continued to receive careful attention at the hands of the Mines Inspectors, but they were considerably hampered in their endeavours in the matter of ventilation by the elastic wording of the Act.

On the whole, however, improvements in the hygienic condition of the coal mines had been taking place, as shown Mr. Wardell in his report for 1885: "When the large number of mines in this district giving off gas is taken into consideration, and the immense number of safety lamps, each requiring to be kept in perfect condition, in daily use, it must be admitted that ventilation has been attended to, care exercised by managers and workmen, and discipline strictly enforced to produce so satisfactory a result."

To the layman it may appear that, with the provision and maintenance of adequate ventilation of the workings, further precautions in the shape of safety lamps, safety explosives, &c., were almost unnecessary. Such is not the case, however, for there is always a danger of a "blower" issuing from the seam; and again, trouble sometimes results from the fire-damp accumulated in a goaf suddenly finding its way into the workings in a most unaccountable manner.

In 1887 an amending and consolidating Act was passed; compared with previous Acts it is of course a distinct advance. Matters formerly appearing in special rules, and which stood the risk of being weakened during the process of "arbitrating" (when that was resorted to), are now incorporated in the General Rules, of which there are thirty-nine. More stringent provision is made for the inspection, by competent persons, of every part of the mine in which workmen are to work or pass, both before work is commenced and during shifts; and the use of safety lamps is more strictly regulated. Further details as to the use of explosives below ground also appear. Before a shot is fired in a place which is dry and dusty, watering or equivalent treatment is required within a radius of twenty yards in all parts where dust is lodged. This Act remains in force to the present day. Since 1887 three minor Acts relating to coal mines have been passed. The first, which refers to check-weighers only, was enacted to give effect to the recommendations of the Royal Commission on Labour. Then

the Act of 1896 gives power to the Secretary of State to modify or prohibit the use of explosives, and the Act of 1900 prohibits the employment of males under 13 years of age underground. It is interesting to note the evidence given before the Royal Commission on Labour concerning employment in the mines: "In the majority of districts no complaint was made with regard to the conditions, sanitary and other, of the mines. . . . It was also stated that . . . the general improvement in the conditions of mining is to be very largely attributed to the operation of the Coal Mines Regulation Acts." ¹¹⁰

Mortality of Miners.

From the foregoing it will be observed that, broadly speaking, there are two classes of miners, viz., coal miners (that is to say, persons working in or about all mines of coal, stratified ironstone, shale and fireclay), and metalliferous miners (that is to say, persons working in or about all mines other than those mentioned above). In addition there is another class to be considered, viz., quarriers. This classification is in conformity with the Statutes regulating employment in mines and quarries, but for statistical purposes such classification is not adhered to except in the case of persons who work in or about quarries. Further, in the case of both coal and metalliferous miners is the relative number of persons who work underground as compared with those above ground plays an important part in this connection.

The investigations carried out by Dr. Headlam Greenhow in 1856-58, led him to the conclusion that in certain counties in which a large proportion of the males were engaged in the mining industry, the death-rate of males from pulmonary affections was abnormally high compared with the rate for females: he deduced that the cause of this was employment in the mines. He also found there were considerable differences between the rates in different mining districts; thus he found the death-rate for the metal mining districts in Cornwall was much higher than that for the coal mining districts of Easington and Houghton-le-Spring. ¹¹¹

A few years later Dr. Farr found that the death-rates of miners aged 15 years and upwards, at each age-period were in excess of the death-rates for "all males" at the same age-periods, as shown below:— ¹¹²

¹¹⁰ "Royal Commission on Labour." Group A, Part I, p. 56.

¹¹¹ "Papers relating to the Sanitary State of the People of England," 1858.

¹¹² "Supplement to 25th Annual Report of Registrar-General," 1864, p. xxxv.

Annual Mortality per Cent. of Males Aged 15 Years and Upwards in the undermentioned Occupations, in the Years 1860-61, at different Periods of Age.

Age.....	Males.							
	15—	25—	35—	45—	55—	65—	75—	85 and Upwards.
Annual Mortality per Cent.								
All males age 15 and upwards	0·721	0·913	1·228	1·767	3·110	6·625	14·882	31·702
Miners, viz., coal, iron, copper, tin, and lead, and others connected with mines	0·824	0·996	1·280	2·027	4·306	10·069	21·613	62·500

Dr. Farr evidently regarded mining as a most unhealthy and dangerous occupation. He wrote: "The miner may be protected from explosions, and to a large extent from underground injuries by greater care on his own part and on the part of the managers and proprietors. He may be saved from the excessive fatigue of ladder climbing; and if the mines were well ventilated, he would not break down by so early and premature old age." Eleven years later Dr. Farr wrote rather more favourably in respect of the mining industry.¹¹³

On the lines adopted by Dr. Greenhow, a fair estimate of the mortality of coal miners compared with tin and copper miners may be obtained by calculating the death-rates for certain districts. Dr. Greenhow found that in 1851 nearly 50 per cent. of the adult males in Easington and Houghton-le-Spring were engaged in coal mining, and about 53 per cent. of adult males in Redruth were engaged in tin and copper mining.

The following table shows for certain districts the annual death-rates per 1,000 living of males between 15 and 65 years of age from phthisis and from phthisis and respiratory diseases for the decennials 1851-60 and 1861-70. In the first column I have inserted Dr. Greenhow's figures of death-rates from pulmonary affections, 1848-54:—

¹¹³ "Supplement to 35th Annual Report of Registrar-General," 1875, p. vii.

Average Annual Death-Rate per 1,000 Living.

District.	Pulmonary Affections. Adult Males. 1848-54.	Phthisis.		Phthisis and Respiratory Diseases.	
		Males 15—65.			
		1851-60.*	1861-70.*	1851-60.*	1861-70.*
England and Wales	5·69	3·76	3·12	5·23	5·26
Redruth (copper and tin)	6·70	5·46	5·42	7·23	7·32
Easington (coal mining).....	2·22	1·68	1·90	2·49	3·03
Houghton (coal mining)	3·64	2·34	2·27	3·48	3·16

* These figures are calculated from the twenty-fifth and thirty-fifth Supplements of the Registrar-General. The forty-fifth Supplement does not contain the necessary particulars to enable me to carry the calculations further.

The great difference between the mortality of metalliferous and coal miners from lung troubles is at once seen.

Dr. Ogle's report respecting the mortality of coal miners in the years 1880-81-82 was exceedingly favourable. He wrote: ¹¹⁴ "The death-rates of coal miners are surprisingly low . . . the comparative mortality figure of these labourers is considerably below that of all males."

"Again, if in each case we exclude accidents, it will be found that the mortality of the coal miners only slightly exceeds that of the most healthy class of men . . . viz., the agriculturist." But Dr. Ogle adds: "It has of course to be borne in mind that miners are a body of picked men. No very weakly man is likely to take to the occupation, and, moreover, as much strength is necessary, many men who become weakly must abandon this form of labour for lighter work."

Apart from that consideration, however, it is beyond fair doubt that the coal miner of 1880-81-82 was far more healthy than the coal miner of 1840, of whom Mr. Scriven had said, "It did not much surprise me to be told that old age came prematurely upon them, and that they were 'smashed up' at '40 or 45.'"¹¹⁵ That the enforcement of the hygienic clauses of the Mines Regulation Acts had greatly assisted in this work of amelioration must be admitted.

Dr. Ogle's report concerning ironstone miners is almost as favourable as that for coal miners, but in the case of Cornish

¹¹⁴ "Supplement to the 45th Annual Report of the Registrar-General," 1885, p. xlix.

¹¹⁵ "Royal Commission on Mines," 1842, part II, Mr. Scriven's report, p. 63.

miners he reports very unsatisfactory conditions: "The mortality of the Cornish miners, who may practically be considered to be tin miners . . . contrasts in a most extraordinary degree with that of coal miners or of ironstone miners. . . . The great bulk of the excess of mortality among the Cornish miners comes under the headings phthisis and diseases of the respiratory organs. . . . The Cornish miners suffer from these diseases more than three times as much as Cornish males in the aggregate, and more than twice as much as the miners in any other great mining centre." The death-rates given on page 39 point to the same conclusion. Further, the mortality rates of Cornish miners in 1849-53 and in 1860-62, given in the report¹¹⁶ of the Royal Commission on Mines are almost identical with Dr. Ogle's figures for 1880-81-82. It would seem therefore that whereas coal miners had benefited considerably by the operation of the Coal Mines Acts, the metalliferous miners of Cornwall had so far not experienced like benefits. That inadequate ventilation is a potent factor in the latter case must be admitted; the Inspector for the district at that period was evidently of that opinion. He wrote:¹¹⁷ "There can be no doubt that the diseases which cause this appalling excess of mortality amongst the Cornish miners are largely due to the insufficient ventilation of the mines and the arduous and injurious work of climbing ladders. Both as regards ventilation and the means of ascent and descent the coal mines are vastly superior to those in this district."

Continuing this matter, it is satisfactory to note that the report on Cornish miners after the lapse of another decade is rather more favourable, but "as compared with those of occupied males, the death-rates of tin miners are excessive at all ages, and give a mortality figure of 1,409, or 48 per cent. above the standard. Tin miners die two and three-quarter times as fast from phthisis, and one and three-quarter times as fast from diseases of the respiratory system as do occupied males generally."¹¹⁸

A recent report¹¹⁹ on the health of Cornish miners shows that the mortality from lung diseases of this class of worker is still exceedingly high, as shown by the following table:—

¹¹⁶ "Royal Commission on Mines," 1864, p. xiv.

¹¹⁷ "Annual Report. H.M. Inspector of Mines, 1885, p. 344.

¹¹⁸ "Supplement to Fifty-fifth Annual Report of Registrar-General." Part II, 1897, p. lxxxiv.

¹¹⁹ "Report on the Health of Cornish Miners." By J. S. Haldane, M.D., and J. S. Martin, H.M. Inspector of Mines, 1904.

Annual Deaths from Lung Diseases per 1,000 Living.

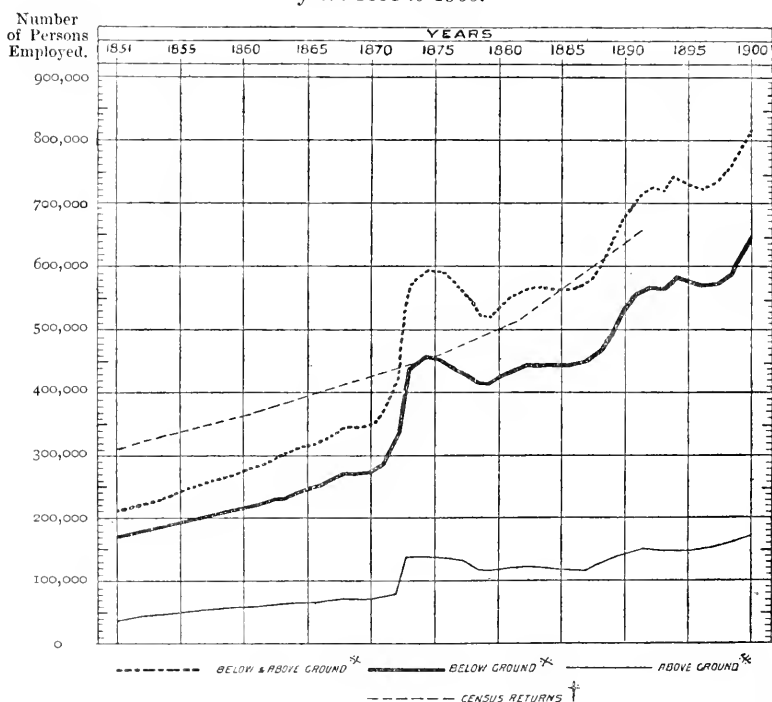
	Ages.					
	15—20.	20—25.	25—35.	35—45.	45—55.	55—65.
Occupied males (England and Wales), 1890-92 ...	0.95	2.7	3.7	5.9	8.6	13.0
Tin miners { 1890-92	1.3	3.7	3.9	9.5	23.0	40.7
(Cornwall) { 1900-02	0.5	2.6	10.5	23.2	29.6	42.8
All miners { 1900-02	0.7	2.7	17.3	33.2	32.2	42.6
(Cornwall) {						
Coal miners, 1890-92.....	0.9	2.0	2.1	3.5	7.8	18.7
Ironstone miners, 1890-92....	1.6	1.5	2.1	3.2	6.5	13.0

It should be noticed that “the excessive mortality from lung diseases had, up till 1892, only seriously affected men of over 40. During the last few years, however, there has been an enormous increase in the death-rate from lung diseases, particularly among younger men from about 25 to 45, with the result that the total death-rate at all ages from 25 to 55 is now far greater than at any previous period during the last fifty years. Between the ages of 25 and 45 the death-rate from lung diseases among miners living in Cornwall has recently been from eight to ten times the corresponding death-rate among coal miners or ironstone miners.”

I turn now to the statistics published by the Home Office relating to deaths from different classes of accident in or about the mines. At the outset I may explain that in these returns each class of miner, coal and metalliferous, is divided into two sections, viz., those employed below ground, the miner proper, and those employed above ground. The former are, of course, all males, and in coal mines they constitute about 80 per cent. of the total number employed, as against about 59 per cent. below ground in metalliferous mines.

The steady increase in the number of persons employed in and about mines since 1850 is shown by the following chart:—

*Number of Persons Employed at Mines of the United Kingdom
from 1851 to 1900.*



* From 1851 to 1860 coal mines only.

„ '61 „ '72 coal and ironstone mines only.

„ '73 „ 1900 all mines.

† The census curve includes all miners employed under and above ground in decennial periods from 1851 to 1891.

According to the latest return,¹²⁰ the number of persons employed in mining in the United Kingdom in 1903 was 871,889, of whom 842,066 worked at mines under the Coal Mines Act, and 29,823 under the Metalliferous Mines Act.

The evidence before the Commissioners of 1842 showed that the hygienic conditions of a large number of the mines were about as bad as they could be ; little or no attention was paid to the most vital matter connected with mining, viz., ventilation. The result was frequent and disastrous explosions, with the loss of thousands

¹²⁰ "Mines and Quarries." General Report for 1903, Part 1, Cd-2115, 1904, p. 6.

of lives in the aggregate. There seems to be no complete record of the actual number of lives lost in this way, which is not altogether surprising, for "before 1814 it was not customary to hold inquests "on deaths of miners killed by accidents in mines."¹²¹ The following is a summary of the number of miners killed in the principal colliery explosions in the United Kingdom from the year 1710 to 1870.¹²²

Period.	Number of Miners Lost.	Period.	Number of Miners Lost.
1710-1797	404	1831-1840	372
1801-1810	122	'41- '50	520
'11- '20	467	'51- '60	991
'21- '30	299	'61- '70	1,478

The Act of 1850 provided for all fatal accidents at coal mines to be reported, hence from that date the records are complete. The following table gives the total number of deaths in and about mines from 1851 to 1903 :—

Total Number of Deaths from Different Causes in and about Coal Mines of the United Kingdom for Fifty Years, 1851-1900, and for the Years 1901, 1902, and 1903.

Period.	Number of Deaths from Accidents.						Total Surface.	Gross Total.
	From Different Causes Underground.							
	Explosions of Fire-damp or Coal Dust.	Falls of Ground.	In Shafts.	Miscellaneous.	Total Underground.			
1851-1900	10,085	22,192	7,147	10,314	49,738	4,584	54,322	
1901.....	125	494	79	280	978	153	1,131	
'02.....	63	467	105	298	933	120	1,053	
'03.....	14	578	71	275	938	159	1,097	
Grand Total }	10,287	23,731	7,402	11,167	52,587	5,016	57,603	

Thus in the last fifty-three years more than 10,200 lives have been lost solely through explosions of fire-damp or coal dust. Although these figures are serious enough, it must be admitted that but for the operation of the Act of 1855 (and subsequent Acts) which provided for the "adequate ventilation" of all coal mines,

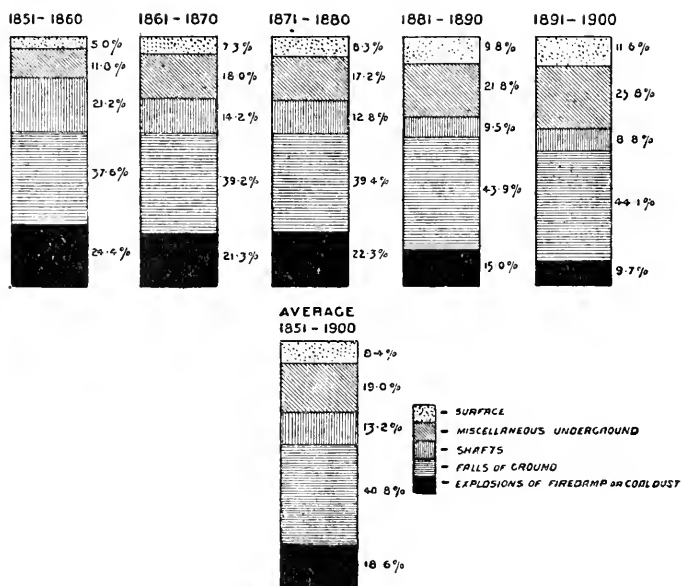
¹²¹ Oliver's "Dangerous Trades." Historical sketch by Miss Anderson, H.M. Principal Lady Inspector of Factories, p. 31.

¹²² Dr. Ure's "Arts and Manufactures," vol. iv, p. 272.

the total deaths from this cause would have been far more appalling. The total number of deaths from explosions which occurred during the five years 1856-60 was 1,286, and if the number of persons employed and the death-rate from that cause had remained constant, the total deaths for fifty years would be 12,860; allowing for increase in numbers employed, the total deaths during that period would probably have exceeded 25,000, instead of which the actual total is about 15,000 less than that. Hence it would seem that by the prevention of explosions alone no less than 15,000 lives have been saved during the last fifty years by the operation of the statutes which regulate the hygienic conditions of employment in coal mines.

The following diagram shows the variation in the proportion of deaths from different classes of accident which have taken place during the years 1851-1900: "In the first decennial period explosions were responsible for nearly one-quarter of the deaths, "in the last for less than one-tenth."¹²³

*Proportion of Deaths from Different Classes of Accidents, 1851-1900.**



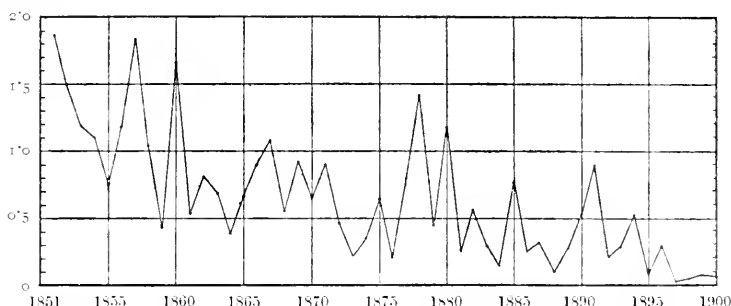
* From 1851 to 1860 coal mines only.

„ '61 „ '72 coal and ironstone mines only.

„ '72 „ 1900 all mines.

Death-Rates from Accidents Caused by Explosions of Fire-Damp or Coal Dust per 1,000 Persons Employed Under Ground in Mines from 1851 to 1900.*

Deaths
per 1,000
Employed.



* From 1851 to 1860 coal mines only.

„ '61 „ '72 coal and ironstone mines only.

„ '73 „ 1900 all mines.

The main factor at work in reducing the number of deaths from explosions has undoubtedly been the general improvement which has taken place in the ventilation of coal mines, although due allowance must be made for increased use of safety lamps, greater attention to storage and use of explosives, damping before shot-firing, competent managers, more intelligent and careful workmen, and other causes tending to render the life of the miner less risky.

Sickness Experience of Miners.

On referring to the tables on pages 458 and 460, it will be noticed that the sickness rates for members of certain friendly societies in Wales, 1856-75, and Northumberland and Durham, 1875-1903, are in excess of the average rates for those societies. The recent experience of the Manchester Unity of Oddfellows, 1893-97, which was investigated by Mr. A. W. Watson, F.I.A., also shows that the sickness claims of miners are excessive even when compared with such dangerous and laborious occupations as quarrying and iron and steel working, as shown by the following table :—

Comparative Sickness Claims of Members Engaged in different Occupations at different Age-periods (1893-97).

	Ages.	Quarry Workers.	Iron and Steel Workers.	Mining Occupations.
All periods of sickness (combined) ..	16—44	172	160	207
	45—64	169	155	214
	65 and upwards	152	183	212
First six months ..	16—44	153	151	192
	45—64	135	125	162
	65 and upwards	122	88	89
After two years	16—44	472	314	469
	45—64	329	286	426
	65 and upwards	212	331	414

Mr. Watson says as regards minerals:¹²⁴ "Group G (Mining), " which includes the large number of 175,186 years of life, stands " apart from the other groups in the extent of sickness liability " which it exhibits at every period of life and at every stage of the " sickness claim."

In these sickness investigations claims on account of accident are of course included, hence if, in the case of miners, due allowance is made for accident claim, their "ordinary sickness" claim would appear to be less than that of the average member of friendly societies. Whether miners now claim for "ordinary sickness" less than they did formerly I have no means of showing, but in view of their diminished occupational mortality they should perhaps also experience less sickness.

Physique of Miners.

Few statistics on this subject are available. In the first place it must be remembered that miners have the credit of being a picked class of men at the commencement of their career; and if the principle of the "survival of the fittest" holds good, it would obviously be unfair to make any estimate of the effect of the occupation on the physique of the workers simply from a series of physical measurements of miners actually employed in the industry at the period of observation. In the case of textile operatives the case is different, for there generation after generation follow the same occupation, but it appears the miners (particularly metalliferous miners) are a more nomadic race than textile workers.

¹²⁴ "An Investigation of the Sickness and Mortality Experience of the " I.O.O.F., M.U., 1893-97." By A. W. Watson, F.I.A., 1903.

The following figures¹²⁵ show that Scotch lead miners, Durham coal miners, and Welsh lead miners have the advantage of male adults of Edinburgh, Glasgow, Sheffield, and Bristol town populations, but owing to the small number examined, the comparisons are of little value:—

Table showing the Stature and Weight of Adult Males (age 23—50 years) under different Conditions of Life.

	Number.	Feet. Inches.	Lbs.
Scotch agricultural population, } Galloway	75	5 10·5	173·6
Yorkshire fishermen, Flamborough	68	5 8·71	166·8
Athletes (running, jumping, } walking)	89	5 8·34	143·7
Scotch lead miners, Wenlockhead	92	5 8·43	163·9
London Fire Brigade	69	5 7·40	160·8
Durham coal miners	51	5 6·38	152·4
Edinburgh and Glasgow town } population	32	5 6·35	137·2
Welsh lead miners, Cardigan	328	5 6·30	155·2
Sheffield town population	100	5 5·80	142·5
Bristol town population	300	5 5·77	142·4
Lunatics, general population	1,409	5 5·70	147·9
Criminals, general population	2,315	5 5·60	140·4
Herefordshire labourers	174	5 5·30	145·0
Idiots and imbeciles	19	5 4·87	123·0

In Mr. Scriven's report on Mines (1842 Commission) comparative statistics are given relating to measurements and muscular development of children employed in mines, mills, potteries, and agriculture. These figures show that although the children employed in the mines were comparatively short in stature, their muscles generally were much more fully developed than were those of the other children. The actual figures are of little value for the purpose of this essay in that no later figures are available for comparison.

In the foregoing pages I have endeavoured to show the effect of British statutory regulations relating to the hygienic conditions of employment in several different industries. Had time and space permitted I should have dealt with other trades in which it may be shown that the operatives have benefited in varying degree from the enforcement of sanitary measures. With such an immense

¹²⁵ "Final Report of the Anthropometric Committee to the British Association, 1882-83." 36.

field, however, I thought it advisable to limit my investigations to some of the more important industries rather than touch lightly on all occupations generally. Even with the trades selected I do not pretend to have completely investigated the whole effect of the statutes concerned, neither do I think finality in the matter would be possible within the limits allowed for this essay. I have purposely omitted to touch the moral, intellectual, and economic sides of the question, but I would refer to Sir Robert Giffen's opening address to the Royal Statistical Society in 1883, in which he so ably surveys the progress of the working classes since the early thirties. How much of the progress which he shows has taken place is the result of the operation of the Factory and Mining Acts I do not venture to estimate, but few, I think, would not allow to those measures some considerable share in the work of "levelling up."

DISCUSSION *on* MR. LEONARD WARD'S PAPER.

THE PRESIDENT said Mr. Ward had rendered the Society a most valuable service in preparing this paper. He had, with rare skill and singular discretion, compressed into a few pages information which was not at hand except after reference to many libraries and consulting more books than were ordinarily at the command of the reader. Those who studied these pages at their leisure would find the information contained therein highly suggestive and encouraging. He had known these mining and factory districts from boyhood, and could bear testimony to the great improvement which had taken place in the condition both of the working classes and the population generally since that time. He could remember perfectly well as a boy the stunted figures, the distorted limbs, the exhausted frames, and the weary countenances of the factory workers. Those evils had now, for the most part, disappeared, and he did not believe that the number of imperfect limbs in the textile districts was larger than it was in the Metropolis, or in all the great towns. That surely was an accomplishment for which everyone who loved his kind ought to be deeply grateful. The early work of reformers in those days was laborious, and involved much unpopularity and even some personal hatred. He could remember the days when Lord Shaftesbury was exposed to most bitter rebuke, and when those who worked with him were not more fortunate. But who

was there now who did not look back on the toil of Lord Shaftesbury with affectionate gratitude? Some of the manufacturers of those days, his personal friends, worked heartily with him, but others did not take the same enlightened view, and it was the privilege of his later days to look back to those former years and to remember those with whom he was then associated. If there were one disease more than another which excited the deepest regret amongst those acquainted with factory hands it was consumption in its various forms. In former days that disease seemed to take off and destroy the fairest of our race and the most promising members of the community; but although he did not believe it would ever be entirely removed so long as the English climate remained what it is, a great improvement had been made in the condition of the mills, both as regards cubic space and also ventilation. Many of the mills in earlier days were probably no loftier than that room, and one could imagine the condition of a number of children left in a room of that height for a greater number of hours than he would like to mention, under circumstances most unfavourable to health. In examining this question from a sanitary point of view they had to regard not only the mill, but also the home. Much of the healthiness of those toiling in the factories depended upon the manner in which their leisure hours were spent, and the degree to which they had recourse, so far as they could, to the fresh air which was now increasingly within their reach. This improvement would no doubt continue. It was felt by all to be a working man's question, and they knew that under the present system of government the vote of the working man had much to say with regard to the sanitary condition of the towns wherein they dwell. The improvements made by statute had been sufficiently described by Mr. Ward. His account had been singularly lucid. The reader made some reference to the pottery industry and to what was known as plumbism, and he feared that the end of their labours in this respect was not nearly reached; but he hoped that by the action of the Home Office and the co-operation of those engaged in the industry that that terrible disease would be largely diminished. He might, perhaps, be considered an optimist, but he thought that in these days we had the good fortune that the great majority of the employers of labour were increasingly anxious to promote the welfare of their hands, and much depended upon the willing assistance of the employer. It was not enough for him to drag reluctantly behind the inspector; it was for him to co-operate with the inspector, and even to march in advance. Nothing was more striking than the debate in the House of Commons last summer, when the vote for the Home Office was under consideration, and when the question of factories was discussed. Expression was given to a most kindly feeling between the employers and employed. They agreed that the employers of to-day were doing their best, and were using every exertion to improve the condition of their hands. If that were so with regard to other industries, no doubt it would be so with regard to pottery also. The lucifer match trade again was a terrible industry many years ago when

the legislature first began to deal with it. He believed the danger would always continue, and trusted the Home Office would persevere in their endeavours to diminish or entirely remove the evil, and also that the great employers of labour would co-operate with them. One other industry only which he might refer to was that of coal mining. It was in a sense our greatest and most important industry, and it was a happy thing to know that partly by the skill of the engineer, partly by regulations introduced by Parliament, and partly by the willing investment of capital to promote safety, loss of life and the deterioration of health in coal mining had greatly diminished. The statements made by Dr. Ogle some years ago as quoted in the paper were very encouraging. He himself believed that the improvement mentioned in that and in other reports relating to our industries was still continuing.

Miss A. M. ANDERSON (Principal Lady Inspector of Factories) said the paper contained such an abundance of material that it was hardly possible to comment upon it immediately, notwithstanding the admirable lucidity with which the material was set out by Mr. Ward. She might refer to an idea that had been running through her mind in listening to it, that there were two directions in which they might advance and no doubt had advanced. The author clearly and instructively traced the great improvement in health due to improvement in surrounding conditions, but it must also be remembered that in combatting and preventing disease the resisting power of those engaged in industrial processes was at least as important a factor, and she should like to see traced out further the enormous effect of the gradual removal by factory legislation from too heavy toil of young children and those less able to resist unhealthy influences, and the reduction of hours of those of tender years who were allowed to remain. Very much still, no doubt, remained to be done in that direction. If they could calculate the share in the improvement which had arisen from the removal of those least able to resist injury, and from giving those who were delicate the opportunity to work only up to the limit of their strength, they might further see the way to such improved organisation that labour should gradually become, as it ought to be, a joy, and not trench on the reserve power of the individual worker or the community. Their attention had been specially concentrated on one big industry in which women and children were employed, the textile industry, in which there had been an enormous improvement, but there were other great industries, such as laundries, clothing, and dressmaking, where an immense amount of the work of investigation of the health of the worker and the surroundings remained to be done. If they could only get full statistics even as regards dressmakers and laundresses, they would probably be surprised at the results as to the injury to health from preventable causes.

Dr. T. M. LEGGE (H.M. Medical Inspector of Factories) said it was impossible to discuss the numerous figures and elaborate curves

presented in this paper without previous study, but he might perhaps strike a personal note in saying that he took credit to himself for being the first person to bring the announcement of the subject of the essay to the notice of Mr. Ward. The points he had brought out very clearly were the great difficulty of ascertaining the conditions of health from general mortality statistics, owing to the smallness of the number of workers engaged in specially dangerous processes. The number of those constituting the whole industry swamped the specially severe statistics affecting particular branches. This was illustrated in the figures with regard to lead poisoning and lucifer match-work, and it was also brought out very strikingly by Dr. Haldane in his recent work on fibroid phthisis among the Cornish miners. It was not until a special census was obtained of the workers in different processes that he could lay his finger on the particular points where reform was necessary; and so it was not until a special census was obtained of the workers in the different processes in the china and earthenware industry, subdivided as minutely as possible, that one could see where especially remedial measures were necessary. He had brought out too the difficulty of separating the effect of general sanitary reforms from special reforms such as could be effected by exhaust ventilation and other local conditions. He had made this very clear by what he had said on the subject of phthisis and respiratory diseases, as illustrated by examples from certain Lancashire towns and among the flaxworkers of Belfast. He was rather surprised that one industry had not been treated at all, a textile industry employing 30,000 or 40,000 persons, namely, the jute industry. There were other agencies at work in improving the conditions which must not be left out of account. The apparent decrease in the number of persons affected with imperfect limbs, to which the President alluded, was more to be attributed to improvements in surgery than to anything else. He was very glad to bear his testimony to the value of this paper.

Mr. H. J. TENNANT, M.P., also bore testimony to the extreme interest of the paper, which, as Dr. Legge had said, merited a more careful study than could be given to it in the few minutes Mr. Ward had occupied. There were some remarks of the President which, without being controversial, he might describe as a little highly coloured and more optimistic than any description he should have given himself. He would most earnestly echo what had fallen from Miss Anderson. Of the three trades specially dealt with, the only one well known to himself was the pottery trade. He agreed that there had been a considerable improvement in the conditions of those engaged in that industry, but it had been only attained with great difficulties, after sharp divisions of opinion and heated debates in the House of Commons, through constant question and answer, and by persistent agitation. There were always to be found protagonists both in the House of Commons and the press, and in other arenas, to champion the cause of those who it was said were competing in an industry which was cut down to the lowest point by foreign competition, which could only just keep its head above water, and

so forth. You would always find gentlemen to take that point of view. He maintained that although they had made great strides it did not follow that there was not a great deal still to be done, and he appealed to those who knew the condition of affairs better than he did, if there was not still there a fine field for the reformer and those who were anxious to improve the lot of the workpeople. There was not only the pottery trade, but the trade of making white lead, of which the glaze was largely composed. That trade also had been improved, but he was sure Dr. Legge would agree with him that there was still much to be done there. Apart from those obviously dangerous trades, there were others which had dangers of their own, less obvious but more subtle, and which operated more slowly. For instance, there was the indiarubber trade; there you had the workers exposed constantly to an unpleasant and somewhat deleterious although not absolutely poisonous atmosphere, very kindred to that of the textile trades. You would not say that weaving cotton was a poisonous trade, but the amount of dust constantly inhaled was deleterious. The same thing applied to the continuous inhalation of the naphtha fumes given off in the indiarubber factories. There were also other dangers—the danger of carbon-bisulphide and their old friend white lead, which came in as a substitute in some cases for carbon-bisulphide. Upon page 471 he saw a statement that Dr. Whittaker reported in 1902 that of the 2,911 deaths reported from phthisis and diseases of the respiratory organs, 1,779 were due to the latter and 1,132 to the former in the linen trade of Belfast. When one read figures like that, although it showed some diminution, the death-rate having sunk from 10·9 to 8 per 1,000, it still showed that the condition of things was not so good as one could wish. Finally, in furtherance of the remarks of Miss Anderson in connection with the laundry industry, he would suggest that if one could only get at the real facts of the case one would probably find that the condition of numbers of women and girls employed in that comparatively domestic task of washing was very far from being what it ought to be; but they could not get at the facts. The return recently issued gave a figure of the number employed which was extremely pregnant. He did not remember the precise figures, but it showed that the numbers employed in institutions not inspected and subject to no law, where there was no supervision as to the conditions in which the women carried on their work, was largely in excess of the numbers employed in the laundries subject to inspection. That was a very important fact, and one which he hoped would be borne in mind. What right had ladies and gentlemen to carry on institutions in such a way that the workers had no industrial rights? The women employed there had as much right to the protection of the law as those in any other laundry, but at present they had no means of enforcing their rights. Again, there were a large number of small laundries employing one or two women or girls in each which were not inspected, and with regard to both of these classes of exempted laundries he felt strongly that an alteration in the law was urgently required.

Mr. GEORGE MOORES (Manchester) said Miss Anderson made use of the phrase, "resistance of the operatives," but she used it in a sense different to that in which he wished to use it, a sense which had not been touched upon either by the reader or any of the previous speakers. The resistance of operatives was something which acted to their detriment notwithstanding all that the factory laws had done with regard to improving the hygienic qualities of the atmosphere. It came in very largely in closing windows and filling up ventilators, so that the cold air could be kept out, and the rooms kept "nice and cosy" as they called it. This retained the moisture, and those who knew the cotton industry were aware that the warmer the room, and the more moisture, within reason, in it, the less work there was for the operative to do; in spinning and weaving the work was less arduous when it was warm and moist than when it was cold and dry. To a great extent this resistance of the operatives acted detrimentally to their health. They wanted educating on this point. This was not only a question in which the operatives lacked knowledge, but the employers also; or, if they did not lack knowledge, they lacked the effort to put it in force. It was only the previous night he had a painful experience of this in a Lancashire town where he was present discussing a question with the Chamber of Commerce. The room was about twice the size of the room in which they were now met, filled with people, and all the windows were shut and the ventilators closed, and when he had done speaking his clothes were sticking to him. When he asked the hall porter at the end of the meeting why the windows had not been opened, the reply was these were factory people and they liked the room as warm as the factory. The people present were employers and managers, but there was the same feeling on the part of the operatives, and he feared it was carried out in their homes, which, consequently, were not as well ventilated as they might be; and in spite of all the factory laws, and the expense employers were put to, the weaving sheds and spinning rooms were not as healthy as they should be, owing to the appliances recommended and provided not being used. He spoke from some years' experience inside the factory as well as outside.

Mr. L. G. CHIOZZA MONEY said it seemed to him that, if they were endeavouring to fix a standard of conditions, everything depended upon what standard they adopted. If they looked back to the early years of the cotton factory system they might afford to be a little optimistic; but there was another standard, and that was the condition, he would not say of an ideally healthy individual, but of the ordinary standard of health. Measured by that standard the figures which had been put before them in Mr. Ward's able paper gave little cause for satisfaction. Broadly speaking, the working classes in this country formed nearly the whole of the population; for the population was about 43,000,000, and of those some 30,000,000 to 32,000,000 constituted what were generally called the manual labourers and their dependents. When they

knew that the death-rate of the whole country had fallen, it was equivalent to saying that the condition of the working classes must have improved. With regard to many of the figures given in the returns which the author had been compelled to use for want of any better, their completeness largely depended upon the amount of factory inspection which actually took place. Mr. Ward was one of a very small band of people who were deputed by the Government to look after the interests of those engaged in factories and workshops. The total number of this devoted band was only 150, and there were about 100,000 factories in the country, so that if the 150 had nothing to do but inspect factories they would have nearly 1,000 each under their supervision. That was a very low standard of inspection, and produced incomplete statistics. Deaths could not be easily concealed, but it was not difficult to conceal cases of injury to health and injury to limb which actually occurred in the factories and were not reported. To the 100,000 factories they might add about 140,000 workshops, a large number of unregistered workshops, and a large number of home workers; and if one took all those into consideration it would be seen at once that this small band of inspectors had far more to do than they could accomplish. These facts had an important bearing on the completeness of the statistics which Mr. Ward was compelled to use. They were complete, doubtless, as regarded the deaths, but not as to injuries to health and person. Everything depended on administration: and as they knew, unfortunately, when the factory inspector had done his work and had at last brought into court, after repeated warnings, some employer of labour, there was generally a Justice of the Peace ready to impose a fine of 1s. and costs, and send the defendant away with great sympathy. In regard to plumbism, it was a most remarkable fact that between 1896 and 1902 there was a decrease from 400 reported cases of lead poisoning to 100. What a remarkable fact that was, and how it proved that after all legislation could be effective in these matters. The cant saying that people could not be made sober by Act of Parliament might contain a germ of truth, but it also contained a large amount of exaggeration, and a figure like that was very suggestive of what could be done by means of legislation. In this connection the Home Office register of lead workers which was now used in all works where lead was used was an example of thorough administration. In that register every person brought into contact with lead was entered, the date when he began work with the lead was entered, and the regular visits of the medical inspector were recorded, and in that way they would get a further decrease in the 100 cases recorded in 1902. That showed how, in addition to legislation, they wanted strenuous administration by the Home Office. In such matters, administration was more than half the battle. There were numbers of cases that did not come before the public. He was in a position where day by day people wrote to him or came to see him with most piteous tales. A few days ago a man came whose case would not appear in the statistics of any possible department. He was employed when in robust health at a works where the Mond furnace gas was used,

and his health was absolutely undermined in about six months. He was discharged by the firm, which showed that the spirit expressed by Mr. Joseph Wedgwood as recorded on p. 472 of Mr. Ward's paper still existed. He would proceed from infirmary to infirmary until at last he found a grave in some unknown spot; he could neither get compensation nor have the satisfaction of figuring as a unit in any of these statistics. There were hundreds and thousands of such cases. Both legislation and administration, therefore, required strengthening, and he was very glad to see representatives of the Home Office present, for he desired to put in a plea for more inspection. It must be obvious that it was quite impossible for a hundred and fifty men and women, however well they did their work, to see that factory law was obeyed.

Mr. WARD in reply said he quite agreed with Miss Anderson that an investigation into other industries would have enhanced the value of the paper, but as the essay was limited to a certain number of pages, a few of the more important industries only could be dealt with. He was sorry to say that the Council had found it necessary to omit a good deal of the essay as originally submitted. He had to thank Dr. Legge for the kindly advice and assistance which he had given during the preparation of the paper. The hemp and jute trade was one of the sections which were crowded out. He agreed also with Mr. Tennant, that the reports of House of Commons Committees and Royal Commissions dealing with factory legislation all showed that the bogey of foreign competition had been brought up at every stage as an argument against any advance in legislation, as the different Factory Bills had come up for consideration. He should like to call Mr. Tennant's attention to the report by Commander Hamilton Smith, recently issued by the Home Office, relating to the conditions of employment in flax and linen mills. This report contained a draft code of revised special rules, which were still under consideration. Finally, Mr. Ward thanked all present for their kind attention.

The following were elected Fellows of the Society :—

Fellows, The Rt. Hon. Ailwyn E.,	Holt, Thomas.
M.P.	Nevill, Henry Rivers.



*A CONTRIBUTION to the STUDY of the VITAL and OTHER STATISTICS
of the JEWS in the UNITED KINGDOM.*

By S. ROSENBAUM, B.Sc.

[Read before the Royal Statistical Society 27th June, 1905.

SIR FRANCIS SHARP POWELL, Bart., M.P., President, in the Chair.]

Introduction.

THE question of Jewish statistics is one which has received but little attention in this country. The *Journals* of this Society do not contain a single paper devoted exclusively or primarily to a survey—comprehensive or limited, extensive or narrow—of the Jewish community in the United Kingdom. It would be difficult to mention any other subject to which the incidental references in the index to this Society's *Journal* are so few.

It is perhaps not altogether surprising that this should be the case. The same neglect is found in the cases of the Church of England, the Roman Catholic, and the various Nonconformist sections into which the country is divided. Every religious communion is, in the words of the immortal Buzfuz, "alike "neglected." The cause is fundamental, and due to the fact that in this country official cognisance is not taken of any religious following outside the Established Church. No census of religious confession, such as we find in nearly every country, and especially in Continental countries, except in Ireland, has been taken at any time within the last century, and I doubt if there exists any material which would permit of even an approximate estimate of the proportions of the population here who follow the various confessions. The overlapping is so considerable, the degree of stringency of observation of the tenets of each faith is so variable, and is further subject to so many local and temporary influences, such as the presence of a successful revivalist preacher, that the difficulties will probably never be overcome by any method short of a special census in which it is incumbent upon each person to return the confession with which he desires to be associated.

Many or most of these difficulties do not extend into the region of Jewish statistics. The Jews as a community are far more

sharply distinguished from the rest of the population than any other religious body. Their religion imposes on them practices which are recognised by the State. Their marriages are, for example, separately returned; their burials are made in specially set-aside cemeteries; their dietary limits them to eating meat which has been slaughtered in accordance with strictly specified regulations; their holidays necessitate that Jewish school children shall have special arrangements made for them; and their Sabbath observance requires the orthodox to take their weekly day of rest on a distinct day. In addition, it is their practice to tend and care for their own poor, and hence in every town containing a Jewish community of any size is to be found a Board of Guardians or other philanthropic institution; while difficulties of language and race differences have caused the working men to form Jewish trade unions, Jewish friendly societies, Jewish soup kitchens, Jewish agnostics, and so on.

Definition of "Jew."

In dealing with Jewish statistics I am confronted at the outset with a difficulty, in that those who marry "according to the rites of the Jews" are not co-extensive with those who at death are buried in Jewish cemeteries. The population who restrict their flesh diet to Kosher (permitted) meat is probably much less extensive than either of these. Hence though statistics of Kosher meat consumption, of Jewish marriages, and Jewish burials are each available, they do not supply information relating to the same extent of population. I am forced therefore to adopt a definition of "Jew" as it will be understood in the present investigation. After some consideration I am convinced that in practice and for statistical purposes a Jew is best defined as one who when he dies is buried in a Jewish cemetery. Though this test is subject to the obvious objection that it can only be applied when a person is dead, yet such a *post mortem* examination will be found convenient, sufficiently effective, and quite practical. Applied to the mass this test is quite satisfactory, though its application to the individual would be impossible. I have adopted it because the population as thus defined will be the most comprehensive, and will comprise all those who might be included in any other definition. Those who observe the Sabbath, eat Kosher meat, marry according to Jewish rites, will almost certainly be buried when dead in Jewish cemeteries. The converse is not equally sure. The net which is spread at death is sufficiently wide, and its meshes sufficiently close, to embrace in its folds practically everyone who would or would not desire to be called a Jew.

Jewish Deaths.

I begin the story of my investigations with the following table of the average number of deaths during the years 1899-1903 at various groups of ages registered by the Burial Boards of the United Synagogue of London:—

TABLE I.—*Average Number and Proportion per 1,000, of Burials at various Age-Groups by the London United Synagogue Burial Society, with corresponding Proportions for London and England and Wales.*

Ages.	MALES.				FEMALES.			
	Average Deaths Jewish (1899-1903).		Per 1,000 Deaths in London, 1891-1900.	Per 1,000 Deaths in England and Wales, 1903.	Average Deaths Jewish (1899-1903).		Per 1,000 Deaths in London, 1891-1900.	Per 1,000 Deaths in England and Wales, 1903.
	Total.	Per 1,000 all Ages.			Total.	Per 1,000 all Ages.		
Under 1	382	404	271	262	290	363	231	222
1	100	106	80	62	90	112	78	61
2	27	28	32	22	28	35	33	23
3	18	20	20	13	15	18	21	14
4	12	13	13	10	10	12	15	10
Under 5	540	571	416	369	433	540	378	330
5—	22	23	26	23	23	29	28	25
10—	14	15	12	13	10	12	13	15
15—	13	14	16	19	10	12	15	19
20—	25	26	22	23	21	26	20	23
25—	49	52	60	56	41	51	56	57
35—	54	57	87	71	43	54	76	69
45—	51	54	99	91	40	50	86	81
55—	62	65	103	112	51	64	99	105
65—	57	60	93	120	57	71	115	135
75—	55	48	55	84	50	63	89	110
85—	14	15	11	19	23	28	23	31
Total...	946	1,000	1,000	1,000	802	1,000	1,000	1,000

The United Synagogue Burial Society was constituted in 1872, and its burial statistics, which are very complete and satisfactory, especially for the later years, date from 1873. At the present time the burials in the United Synagogue Cemeteries represent about 80 per cent. of the total Jewish burials in London. The distribution by sex and age at death may be regarded therefore as typical and truly representative of deaths of London Jews. Certain reservations to this assumption will be made subsequently, but do not affect the investigation at the present stage.

The following conclusions may now be drawn from an examination of Table I:—

(a.) Of 1,000 deaths at all ages—

- (1.) Among Jews 571 in the case of the males, and 540 in the case of the females occur before the age of 5.
- (2.) For the whole of London the corresponding figures are 416 (males) and 378 (females).
- (3.) For England and Wales the figures are 369 (males) and 330 (females).

(b.) Of 1,000 deaths under 5 years of age—

- (1.) Among Jews 708 in the case of the males, and 672 in the case of the females occur before the end of the first year.
- (2.) For the whole of London the corresponding figures are 652 (males) and 611 (females).
- (3.) For England and Wales the figures are 710 (males) and 675 (females).

(c.) To every 100 deaths of adults between the ages 15 to 44 (inclusive)—

- (1.) Among Jews there are 409 males and 407 females below 15, and 162 males and 192 females at ages 45 and upwards.
- (2.) For the whole of London the corresponding figures are 246 males and 251 females below 15, and 195 males and 248 females at ages 45 and upwards.
- (3.) For England and Wales the figures are 239 males and 220 females under 15, and 252 males and 275 females at ages 45 and upwards.

These conclusions are summarised in the following short tables:—

TABLE II.—*Deaths under 5 per 1,000 Deaths at all Ages.*

	Jews (1899-1903).	London (1891-1900).	England and Wales (1903).
Males	571	416	369
Females	540	378	330

TABLE III.—*Deaths under 1 per 1,000 Deaths under 5.*

	Jews (1899-1903).	London (1891-1900).	England and Wales (1903).
Males	708	652	710
Females	672	611	673

TABLE IV.—*Deaths under 15, and at 45 and upwards, per 100 Deaths at Ages 15 to 44 (inclusive).*

	Jews (1899-1903).		London (1891-1900).		England and Wales (1903).	
	Under 15.	45 and Upwards.	Under 15.	45 and Upwards.	Under 15.	45 and Upwards.
Males	409	162	246	195	239	252
Females	407	192	251	248	220	275

The absence of any information as to the extent of the Jewish population in London makes it impossible to convert directly the ascertained number of Jewish deaths into anything corresponding to a death-rate. The available materials have therefore been thrown into the above forms to permit of a discussion of these returns.

We notice first how large a proportion the deaths of children under 5 bears to the total recorded Jewish deaths. In the case of the males, for example (Table II), the proportion is 571 per 1,000, as compared with 416 in London and 369 in England and Wales. The case of the females is similar, though the divergence is even greater as compared with London. By at least one witness who appeared before the recent Royal Commission on Alien Immigration the conclusion was drawn from these figures—a conclusion which was said to have received the support of an experienced actuary—that it represented an abnormally high infant mortality. This result, sufficiently startling in view of the frequent encomiums which have been passed on the care of Jewish mothers by every medical officer who is brought in contact with them, is not warranted, however, by these figures. These are consistent, as will be shown, equally with a high as with a low infant mortality. A sufficient explanation of the high proportion of deaths under 5 might be due to the presence of an abnormally large number of lives at ages below 5 when the mortality is high; or to the small number of lives at the highest ages, say 45 and upwards, when the mortality is again high; or to an exceptionally low adult death-rate; or to a high birth-rate; or it might be due to a combination of two or more of these factors. An unlimited number of hypotheses are theoretically capable of explaining adequately the particular phenomenon to which first attention has been drawn. The correct explanation always resolves itself ultimately into an answer to the question of the distribution of the Jewish population at different ages, which will be dealt with later.

These results agree very closely with the figures given in evidence to the private committee which was appointed by the

Chief Rabbi to inquire into infant mortality in the Jewish community. Out of 7,996 interments by the United Synagogue in the years 1889-94, the number returned as under 5 was 4,463, or 55·8 per cent. This corresponds almost exactly with the figures for the present day. If attention be restricted to children under 5, it is seen (Table III) that while the deaths under 1 per 1,000 deaths under 5 differ considerably in excess from the deaths in London as a whole, the proportions are identical with the figures for England and Wales. This would appear to point to a somewhat higher infant mortality among Jews in London than among the population generally. Again, however, it may be shown that such a conclusion is unwarranted by the figures. I have carefully examined the relation between deaths under 1 per 1,000 births, and the proportion to deaths under 5 for each of the London boroughs for 1901. From this it appears that there is no direct relationship between the two qualities. One lot of figures is moving up, while the tendency of the others is to go down. If anything, the higher proportion of Jewish deaths in the first year to deaths under 5 would point to a lower infantile mortality. In 1889-94 the figures collected by the Infant Mortality Committee to which I have referred show that the deaths of children under 1 amounted to 64·8 per cent. of the deaths under 5, and to 26·1 per cent. of the deaths at all ages. The deaths under 1 in all London averaged about 25 per cent. of the deaths at all ages.

The principal difficulty in the way of a satisfactory comparison of the deaths of Jews at various ages is caused by a complete absence of knowledge of the lives at various ages. Some idea of the degree of difference in this respect may be obtained from an examination of the figures in Table IV, where the deaths under 15 and at 45 and upwards are respectively compared with the number of deaths of adults between the ages of 15 and 45. In this way an approximate standard of comparison has been set up against which the deaths at younger and older ages may be compared. The differences between Jews, London generally, and England and Wales are found to be considerable. To every 100 male deaths between 15 and 45, there were 409 under and 162 over these ages in the Jewish experience; 246 under and 195 over in London; and 239 under and 252 over in England and Wales. The greater proportion of deaths over 45 in the country as a whole is known to be due to the presence of a much greater proportion of old people. It might be inferred from this that the contrary tendency which is manifested in the Jewish figures is probably due to the presence of an exceedingly small proportion of old people.

The proportion between male and female deaths is another point of some interest. The following table (V) presents the main features bearing on this point in summary fashion :—

TABLE V.—*Deaths of Females to every 100 Males among Jews, in London, and in England and Wales, at Four Groups of Ages.*

Age-Group.	Jews. (1899-1903).	London. (1901).	England and Wales. (1903).
0—	80	87	83
5—	91	104	104
15—	81	87	96
45—	96	109	101
All ages	85	96	93

The divergencies from general experience manifested by these figures increase still further the difficulties in dealing with the Jewish statistics. At all ages the deaths of males are more numerous, while in the case of London this excess is found only in my first and third groups, *i.e.*, infancy and middle age. In the second and fourth age-groups, *i.e.*, school and old age periods, the deaths of females exceed those of males—the former by 4 and the latter by 9 per cent.

DIAGRAM A.

Proportion of Male Deaths at and Exceeding Various Ages.

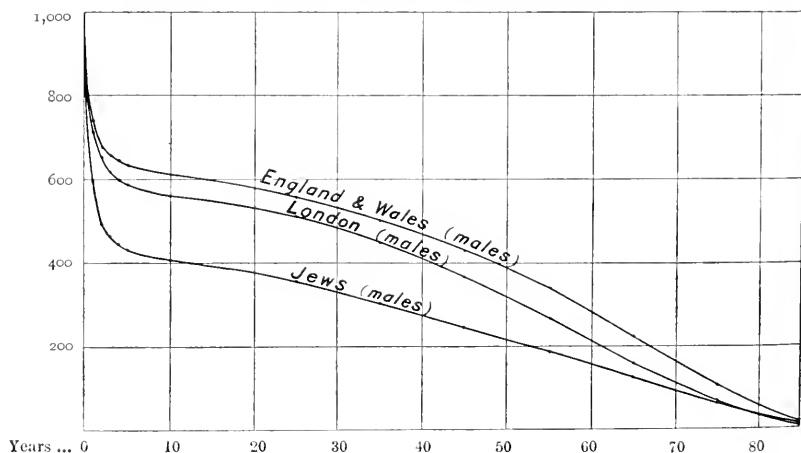
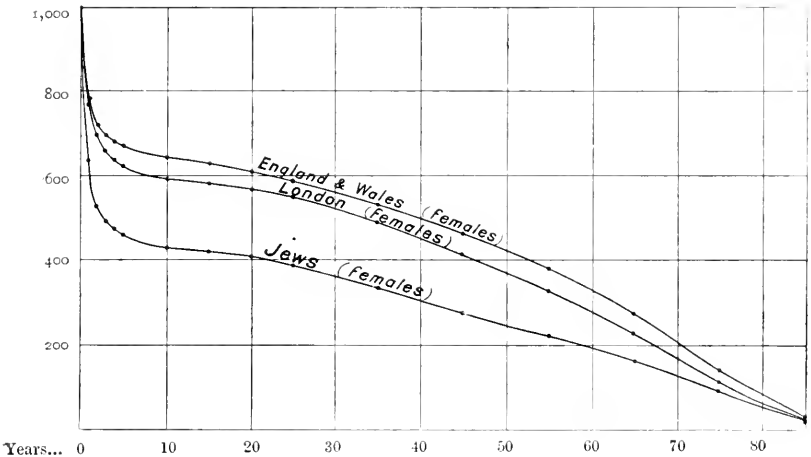


DIAGRAM B.

Proportion of Female Deaths at and Exceeding Various Ages.



In diagrams (A and C) the main differences between Jewish and general deaths are graphed. Ages at death are drawn as abscissae, and proportion per 1,000 deaths at and above any age are drawn as ordinates. The curve at the lower ages is so steep that it was found necessary to re-draw this portion to a larger scale (see diagram C). The results obtained are very striking, and may be best represented by indicating the various quartiles for Jews in London generally.

DIAGRAM C.

Proportion of Deaths per 1,000 Deaths at All Ages, at and Exceeding Ages 0 to 5.

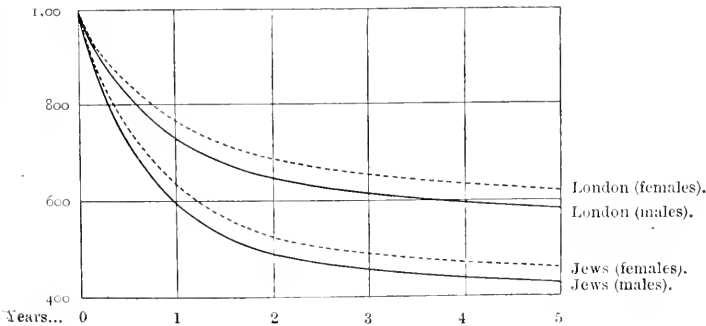


TABLE VI.—*Quartile Ages for Jews and London generally.*

	Jews.		London.	
	Males.	Females.	Males.	Females.
1st quartile.....	5·4 months	6·2 months	10·7 months	14·2 months
2nd „	1·88 years	2·61 years	26·2 years	33·5 years
3rd „	41·5 „	50·0 „	56·5 „	63·0 „

It is at first sight somewhat remarkable that the median age, *i.e.*, the age at which 50 per cent. of all deaths has been reached, is in the case of Jews so low as 1·88 years among males and 2·67 years among females, while for the general population it is so high as 26·2 years for males and 33·5 years for females. At the age when 50 per cent. of all Jewish deaths have occurred the population generally has lost by death only 34 per cent. of the whole numbers. A satisfactory explanation of these apparent anomalies has been sought for, and will possibly be found in the sequel.

The figures I have given so far represent the experience of the United Synagogue during the years 1899-1903. These cover some 80 per cent. of the interments in Jewish cemeteries in the London area. That this experience is however not unique is seen from the figures relating to the Glasgow community, which the Secretary of the United Synagogue of Glasgow has very kindly compiled at my request. The detailed figures are given in the appendix, but the following summary may be inserted here :—

TABLE VII.—*Burials in Glasgow Jewish Cemeteries during 1899-1904.**

Ages.	MALES.		FEMALES.		Female Deaths per 100 Male Deaths.
	Number of Deaths.	Per 1,000 Deaths.	Number of Deaths.	Per 1,000 Deaths.	
0—	125	113	91	542	73
5—	8	39	11	66	138
15—	37	181	31	184	84
15—	34	167	35	208	103
Total.....	204	1,000	168	1,000	82

* Omitting cases where ages are not stated.

The differences evinced by this table and the corresponding figures for London already given are no greater than would be expected when dealing with a considerably smaller Jewish population living in different towns under different conditions.

The main features are however similar, and suggest the inference that the statistical properties of the Jews in London and Glasgow are approximately the same.

I may add also the experience of the Manchester Old Hebrew Congregation, which may be regarded as typical for that city. Out of 307 male and 296 female burials in the years 1899-1903, no fewer than 167 males and 142 females were of children under 5. This works out to 543 and 479 per 1,000 males and females respectively.

Age and Sex Composition.

The wide divergencies already noted between the general and Jewish population are undoubtedly due to the fact that the Jewish community is not a settled one, subject only or mainly to growth by natural increase (*i.e.*, by excess of births over deaths). It is constantly and continuously being fed by immigration from abroad, and especially from the countries in Eastern Europe (Russia, Russian Poland, and Roumania). These immigrants consist mainly of adults, a large excess being males. They include a small proportion of children and of old people. This may be seen from an examination of the census figures for foreigners in London in 1901.

TABLE VIII.—*Proportion of Foreigners and Russians in London at Three Groups of Ages, and Comparison with Age-Distribution for England and Wales (Census 1901).*

	Foreigners.		Russians.*		England and Wales.	
	Males.	Females.	Males.	Females.	Males.	Females.
0—	82	121	135	158	335	314
15—	744	702	745	713	477	483
45—	174	177	120	129	188	203
	1,000	1,000	1,000	1,000	1,000	1,000

* Including Russian Poles.

The Russian population, which may be regarded as resembling most closely the foreign section of the Jewish community, contains, according to the last census, 745 males and 713 females at ages 15 to 45, per 1,000 of all ages. The remainder is nearly equally divided between those under 15 and those at and over 45. The number of children under 15 is appreciably larger, and the number of old people over 45 is correspondingly smaller than for foreigners generally. Indeed, if Russians and Russian

Poles are excluded, the remaining foreigners are found to contain only 53 males and 89 females under 15 per 1,000 at all ages. This fact has some connection with the transitory character of the residence of the alien population other than those born in Russia, Russian Poland, Galicia, &c. The proportions at ages 45 and upwards are much larger—204 for males and 218 for females. The proportions at the middle-group of ages work out to 743 for the males and 693 for the females respectively. Compare these figures with those for England and Wales, where, roughly, one-third of the population is under 15 and one-half between the ages of 15 and 45. Incidentally it may be remarked that these figures suggest an explanation for the abnormally low rates at which the foreigner, and especially the newly arrived Jew, is willing to work. His dependents are considerably fewer, and his expenses necessarily smaller. The absence of any large number of dependents makes it also less frequently necessary for the wife to go out to work to supplement her husband's income. It would be difficult to say how much of the traditional restraint exercised by Jewish husbands in this respect is accounted for by the absence of this important economic factor. Among the Russian foreigners the males between 15 and 45 constitute nearly 40 per cent. of the total Russian-born population, male and female. This compares with the proportion of 24 per cent. among the general population in England and Wales. Thus whereas the Russian on arrival here has to provide for an average of $1\frac{1}{2}$ months besides his own, the native has to provide for an average addition of $3\frac{1}{6}$ months. Even when allowance is made for the difference in age and the consequent needs of the average dependent, and also for the number of dependent parents, wives and children left behind, who have to be more or less provided for, the handicap is considerably in favour of the foreigner. It is a potent factor in mitigating the pressure of the earlier years of his sojourn here, and increasing his competitive power in the labour market.

These conclusions are strengthened, in so far as they relate to Jews, by the figures published a few days ago in the last Annual Report of the Poor Jews' Temporary Shelter. This institution provides temporary shelter to immigrants on their arrival from the Continent to settle in this country, or as transmigrants on their way to other countries. In the year ending 31st October, 1904, the aggregate number of inmates of the shelter amounted to 4,769. Of these, 406 were under 10 years old, and only 76 were over 50. It may be added that 2,824 were married (*i.e.*, married, widowed and divorced), and 1,945 were unmarried. The returns unfortunately do not separate the sexes, the result of which could only increase

the value of the interesting information contained in these annual reports.

I pass on now to an examination of the effect of the settlement of these foreigners in particular districts. About 80 per cent. of the Russians and Poles enumerated in London were found in the borough of Stepney. It will be particularly interesting therefore to examine the effect on the age-distribution of the borough of Stepney and of the several registration districts of which the borough consists. In the following table I have given these figures for four groups of ages, and have given also the corresponding figures for London generally, and for England and Wales:—

TABLE IX.—*Proportions at Four Groups of Ages per 1,000 All Ages in Undermentioned Districts, and for London and England and Wales (Census 1901).*

	MALES.				FEMALES.			
	0—	5—	15—	45—	0—	5—	15—	45—
Borough of Stepney	132	213	499	156	135	219	483	163
Whitechapel	125	199	523	153	137	222	487	144
St. George-in-the-East	146	219	499	136	150	231	474	145
Stepney	127	218	486	169	130	225	474	171
Mile End Old Town	134	219	487	160	127	209	484	180
London	116	200	503	181	103	182	518	197
England and Wales	118	217	477	188	111	203	483	203

The general tendency shown by these figures is for the proportion of children to be increased, and for the old people to be diminished. This tendency is manifested most strongly in the two districts (*i.e.*, Whitechapel and St. George-in-the-East) where the proportion of foreigners is greatest. The number of children under 5 is 116 per 1,000 males, and 103 per 1,000 females in the whole of London. These proportions rise to 132 and 135 respectively in the borough of Stepney, and to 146 and 150 respectively in St. George-in-the-East. The smaller proportion of female children in London is accounted by the large excess of females between the ages of 15 and 45. In Stepney and the registration districts of which this borough is composed there is a large excess of males at these ages. Hence it comes about that the proportion of male children is smaller than for female children in all districts except Mile End, where the alien population is insignificant.

The economic effects of this immigration are perhaps best indicated by the following table, in which is shown the number of children under 15 and of persons at and over 45 per 100 of the population between the ages of 15 and 44 (inclusive) in each of the given areas. I assume the working population of these several districts to be comprised within these limits of ages:—

TABLE X.—*Number under 15 and over 44, in Undermentioned Districts, per 100 of the Population between the Ages of 15 and 45 (Census 1901).*

	MALES.		FEMALES.	
	Under 15.	45 and Over.	Under 15.	45 and Over.
Borough of Stepney	69	31	73	34
Whitechapel	62	29	72	29
St. George-in-the-East	73	27	80	31
Stepney	71	34	75	36
Mile End Old Town	73	33	69	37
London	63	36	55	35
England and Wales	70	39	65	42

It is seen that the number of children is appreciably larger, but the number of old people considerably smaller than for the whole of London. The deficiency in children among the immigrants is more than made up, while the number of old people approximates more closely to the proportions subsisting in the general population. It will appear later that the high proportion of children is accountable for, as might have been surmised, by the high Jewish birth-rate; while the same cause will tend to diminish relatively the number of old people.

It would appear from the figures given in the preceding tables that the Jewish population with its large proportion of aliens—and mainly because of it—has an appreciable influence on the age-composition of the district in which they live. I am unaware of any attempt previous to the one I am about to describe which has been made to determine the age-composition of the Jewish community in the United Kingdom. A special investigation conducted in the United States in connection with the 1890 census was carried out on about 10,000 Jewish families, consisting of about 60,000 persons, to determine the principal features connected with the vital statistics of the Jews. The results of this investigation were embodied in a special bulletin (No. 19, 1890), a copy of which can be seen in the library, from which the age-composition of the Jews in the United States might be inferred.

The principal results arrived at from this American investigation are contained in a special table included in the Appendix. It may

be here mentioned, however, that it showed for every 1,000 Jews, 523 were males, and 477 were females. Of the foreign-born Jews, the males numbered 575, and the females 425 per 1,000 of both sexes. Furthermore, 319 out of every 1,000 at all ages are under 15, and 169 are over 45; or to every 100 between the ages of 15 and 45, the number below 15 is 62, the number over 45 is 33. These figures correspond almost exactly with the figures for Whitechapel and St. George-in-the-East in the above table.

So far as one can judge there is no *à priori* reason to expect that the Jews in America differ materially in respect of age and sex-composition from those in this country, except that the immigration factor is of greater importance there, and is larger, both absolutely and relatively, than here. The fact that the investigation was limited to families whose male heads had been residing in America for five years or more, would tend to make the results more comparable, by equalising the populations to be compared. It is worth noting also that in France, though there has been no Jewish census, a census of foreigners was carried out in 1891. The results of this census are of some interest in connection with the immediate subject of the present paper in that "Foreigners" in France include also children of foreign parents born in France, which brings that problem more into line with that which is under discussion. Whereas, however, such foreigners include only two generations, the Jews we are contemplating sometimes include very many generations subsequent to the one which we should term foreign. While in the departments on the frontiers the foreign population could hardly be compared with the foreign or Jewish population here, yet if attention be confined to the foreign population of, say, the department of the Seine, results of some value may be obtained.

In this country there has never been any Jewish census, nor any census of foreigners such as the term is understood in France. Is it possible then to infer the age-composition of the Jewish population? I have attempted to do this approximately in the following manner: I premise that there is some definite relationship between the number of Jews and the number of Russians in the borough of Stepney. It is assumed further that the non-Jewish population of Stepney is approximately similar as regards age and sex-distribution to the average of the boroughs of Bethnal Green, Shoreditch, Bermondsey, and Southwark, where the number of foreigners is small and the conditions otherwise similar. The first assumption will give approximately the number of Jews in Stepney. The difference between this figure and the census population will give the non-Jewish population. This is distributed according to age and sex in accordance with the second assumption,

and the difference between each figure and the corresponding one shown by the census of 1901 gives the corresponding Jewish figures at that time. The process is explained in Table II.

The approximate number of Jews in Stepney may be inferred from table in the "Sixty-eighth Annual Report of the Registrar-General "for Births, Marriages and Deaths" (p. xv). It is there stated that the Jewish marriages in the five districts of London City, Bethnal Green, Whitechapel, and St. George-in-the-East numbered 320 per 1,000 marriages of all kinds. In these districts the number of the natives of Russia, Russian Poland, and Roumania was given as 117.4 per 1,000. While the number of Jewish marriages is not the same as the number of marriages of Jews, some of them being married by the Registrar or in a church, it is also probably true that the number of enumerated inhabitants of the above districts should also be somewhat larger. I think it is a fair additional assumption to make that all the natives of the countries mentioned, enumerated in the five districts referred to consist almost entirely of Jews. The former figures suggests that the Jewish population of these districts is 320 per 1,000, and hence the number of Jews is $\frac{320}{117.4} = 2.74$ the number of natives of these East-European countries. Hence in the borough of Stepney, which at the time of the last census contained 43,712 aliens whose country of birth was given as Russia, Russian Poland, or Roumania, the estimated number of Jews is 119,770, leaving 178,830 for the number of non-Jews in the borough. The estimated age and sex-distribution of both the Jewish and non-Jewish sections of the community are given in the following table:—

TABLE XI.—*Estimated Age and Sex Distribution of Total, Non-Jewish, and Jewish Population, respectively, in the Borough of Stepney.*

Age-Group.	Population as Enumerated (1901).		Non-Jews (Estimated).		Jews (Estimated).	
	Males.	Females.	Males.	Females.	Males.	Females.
0— ...	19,940	19,870	11,350	11,480	8,590	8,390
5—	32,210	32,390	19,200	19,300	13,010	13,090
15—	30,570	30,960	17,230	17,890	13,340	13,070
25—	25,790	23,680	14,400	14,320	11,390	9,360
35—	18,790	16,860	11,190	10,760	7,600	6,100
45—	12,280	11,510	7,830	7,780	4,450	3,730
55—	7,090	7,200	4,640	4,950	2,450	2,250
65—	3,100	3,890	2,120	2,620	980	430
75—	950	1,530	650	1,100	300	430
Total ...	150,720	147,890	88,620	90,210	62,110	57,690

This table represents, I believe, the first attempt to distribute the Jewish population of London or of any part of it according to age and sex. It would be difficult if not impossible to say how near these figures are to the truth, *i.e.*, what is the probable error. Such error as may arise, however, will be mainly due to the first assumption as to the method of estimating the Jewish population from a combination of the marriage and alien statistics in a given district. The correctness of that assumption is strongly corroborated by the results reached by a totally different method, described by me in a paper which I read a little while ago before the Society for Jewish Statistics. Before describing that method, I will first extend the estimates in the above table to the whole of London. The total number of aliens from Russia, Russian Poland, and Roumania in the London area was 55,153. But whereas practically the whole of the natives of these countries resident in Stepney could be assumed to be Jews, the same is doubtless untrue when the whole of London is considered. It is impossible to make any accurate allowance for the number of non-Jews included in this figure, but considering the number of political exiles, mostly non-Jews, and deserters and other emigrants, I do not think that 3,000 can be regarded as an exaggerated figure. This would give a balance of about 52,650, to which if the multiplier 2.74 is applied, as previously explained, the number of Jews in London in 1903 was about 144,300. In the paper which I read elsewhere the result arrived at for the same year was 138,860, being less than the above by about 5,500. This result is sufficiently near to warrant some confidence being put in the result mentioned.

In the method adopted on that occasion I supposed the Jewish community to be divided up into four divisions according to age. The groups were, (i) 0—4 years; (ii) 5—14 years; (iii) 15—44 years; (iv) 45 years and upwards. To each of these groups a different criterion was applied, to permit the extent of the population to be separately determined. Thus to the first and fourth groups I applied the corresponding London death-rates at these ages. The death-rates at these age-groups are so high that the probable error in the result is likely to be small, or at any rate within say 5 per cent. For the second group, *i.e.*, 5—14 years, the ascertained number of Jewish school children in London elementary schools was employed, a very simple relation being found to subsist in London between the total number of children on the elementary school rolls and the census population between the ages of 5 and 14. Thus in 1901, while the average number of elementary school children in London was 667,000, the census returns gave 678,000, the latter figures only exceeding the former by 1.6 per cent. The number of children aged 14

amounted to an additional 9 per cent. of this figure. Hence as, according to the investigations of the editor of the "Jewish Year Book," the number of Jewish children in voluntary and board schools in the London area at the beginning of 1904 was 31,500, adding 9 per cent., as above, we get the value of 34,300 as the number of children between the ages 5—15.

There remained now to determine only the number between the ages of 15 and 44 inclusive. For this I assume that the most useful criterion was the number of Jewish marriages, this being an approximately constant function of the population between these limits of ages. In England and Wales the number of marriages in 1901 average 16·3 per 1,000, and in London, 15·8 per 1,000, of the population between the ages of 15 and 44. I assumed, therefore, as being probably approximately correct, a marriage-rate of 16·16 per 1,000 among Jews, giving what I called a "marriage factor," *i.e.*, the ratio of population to number of marriages, of exactly 60. The number of recorded Jewish marriages in 1903 in London was 1,287, giving a population for this group of 77,220. The results arrived at by this method for the Jewish population of London in 1901, was as follows:—

Ages.	Jewish Population.	Per 1,000.
0—	16,450	119
5—	34,300	217
15—	77,220	556
45—	10,890	78
Total.... ..	138,860	1,000

In the next table is given the proportion at each group of ages per 1,000 of each sex in London and for Jews in Stepney:—

TABLE XII.—*Proportion per 1,000 of each Sex among Stepney Jews and Non-Jews, and Percentage of Number of Jews to Total Population of Stepney of similar Age and Sex.*

Ages.	Stepney Non-Jews.		Stepney Jews.		Per Cent. of Total Population.	
	Males.	Females.	Males.	Females.	Males.	Females.
0—	128·1	127·2	138·3	145·4	42·6	42·2
5—	216·7	214·0	209·5	226·9	40·4	40·4
15—	194·5	198·2	214·8	226·6	43·6	42·2
25—	162·5	158·8	183·4	162·2	44·2	39·5
35—	126·3	119·3	122·4	105·7	40·4	36·2
45—	88·4	86·3	71·7	64·7	36·2	32·4
55—	52·3	54·9	39·5	39·0	34·6	31·3
65—	23·9	29·0	15·7	22·0	31·6	32·7
75—	7·3	12·3	4·7	7·5	31·6	28·1
	1000·0	1000·0	1000·0	1000·0	41·2	39·0

DIAGRAM D.

Estimated Distribution of Jews and Non-Jews in Stepney at Various Groups of Ages. Males.

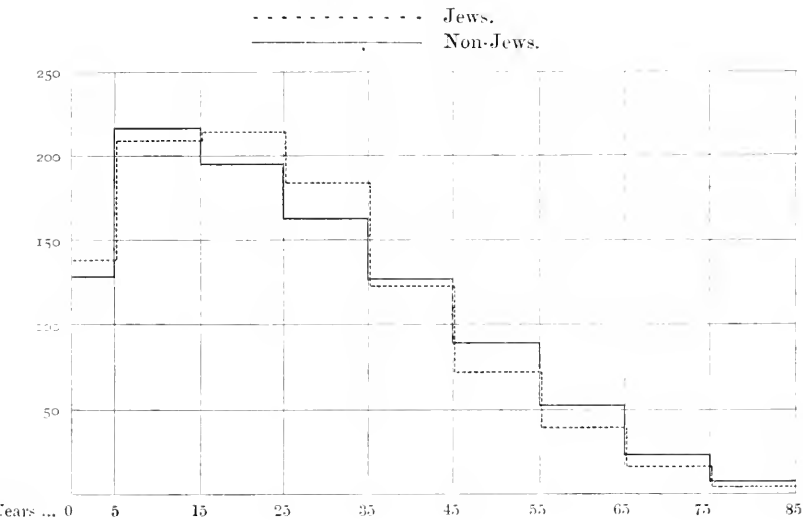


DIAGRAM E.

Estimated Distribution of Jews and Non-Jews in Stepney at Various Groups of Ages. Females.

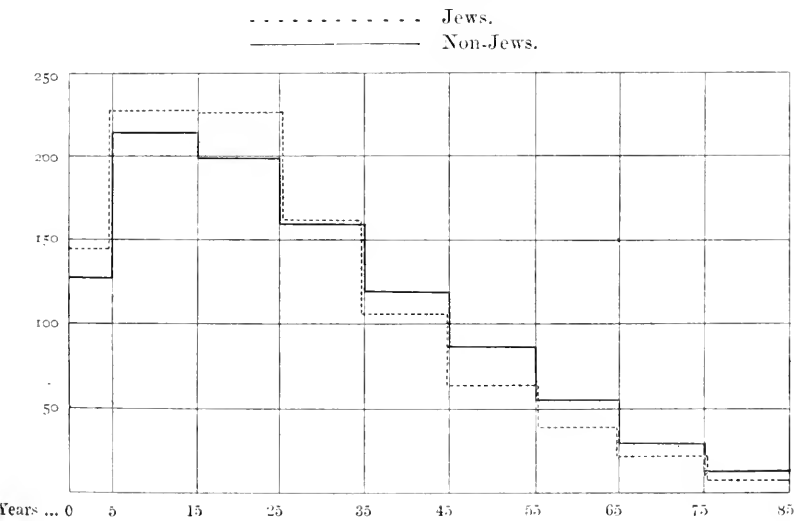
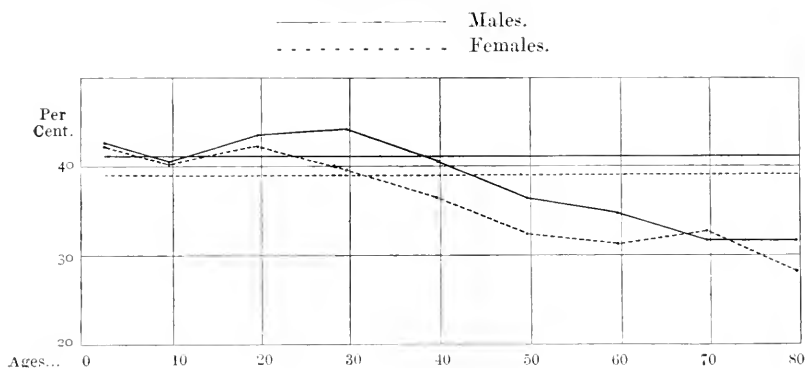


DIAGRAM F.

Estimated Percentage of Jews to Total Population of Stepney at Various Ages, 1903.



An examination of these figures will supply an explanation—an almost sufficient explanation—of the specially abnormal conditions shown in the first examination of the proportion of deaths at different ages. It is seen that whereas, compared with the number of adults, the number of Jewish children is only slightly greater, the number of old lives is very considerably less than among Jews. The nature of the difference is shown most clearly in the last two columns, in which is given the percentage of the number of Jews in Stepney at each group to the corresponding total population. Whereas the number of males I estimate to constitute 41.2 per cent. of the total Stepney population, the child population is 42.6 per cent. at ages 0—4 years, and 40.4 per cent. at ages 5—14 years. The proportion attains a maximum of 44.2 per cent. in the period 25—34 years, after which it diminishes steadily in each successive age-period to the figure 31.6 per cent. at ages over 65 years. The case of the females is very similar, but the features are slightly more accentuated. The paucity of high-mortality lives at one end of the scale, combined with a slight defect at the other end, is sufficient, even with ordinary rates of mortality current in London, and even more especially in the East-End boroughs, to make the proportion of deaths under 5 rise to so high a figure as 500 per 1,000 deaths at all ages. It is clear therefore from this examination that the conclusion as to a high infant mortality among Jews is not warranted by the premisses submitted.

Jewish Death-Rates.

The question next arises as to the possibility of making even an approximate estimate of the Jewish mortality at various ages. This involves an accurate knowledge not alone of the total Jewish population but also of the numbers at various groups of ages. When these are combined with the figures as to Jewish deaths for the whole of London the required result is obtained. I have already given my estimate of the total number of Jews in London in 1903. I think it is a not unreasonable assumption that the distribution according to age and sex of the whole Jewish community is not appreciably different from that of the Stepney section. Though it is true that such migration as takes place from Stepney to the north and north-west, Hackney, Finsbury, and Hampstead, comprises a larger proportion of adults and those aged 45 and upwards, yet because the Jewish population in Stepney is 75 per cent. of the total in London, the error which this fact introduces is likely to be inconsiderable.

These assumptions have been employed in working out the details of the following table. The deaths are compiled from the tables of burials in the various Jewish cemeteries in London given in the appendix. I add the death-rates at corresponding ages for the latest available year in London and England and Wales.

TABLE XIII.—*Estimated Jewish Population, Deaths, and Death-Rates at different Ages, with Comparative Rates for London and England and Wales, 1903.*

Ages.	Jews.						London Death-Rates.		England and Wales Death-Rates.	
	Number.		Deaths.		Death-Rates.		Males.	Females.	Males.	Females.
	Males.	Females.	Males.	Fe- males.	Males.	Females.				
0—	10,350	10,100	67·4	527	65·10	52·15	54·12	46·44	51·7	42·9
5—	15,670	15,770	44	36	3·56	2·28	2·49	2·54	2·6	2·8
15—	16,070	15,740	51	30	3·17	1·91	3·13	2·54	3·5	3·1
25—	13,720	11,270	63	48	4·59	4·26	5·81	4·32	5·8	4·9
35—	9,160	7,350	46	45	5·02	6·12	11·25	8·66	9·6	8·1
45—	5,370	4,500	71	51	13·22	11·33	19·83	14·24	16·9	13·0
55—	2,950	2,710	87	65	29·49	23·99	34·73	24·28	32·1	24·6
65— ...	1,170	1,530	55	66	47·01	43·14	67·02	52·18	65·2	54·5
75—	350	520	70	85	200·00	163·59	140·50	125·90	146·1	129·1
	74,810	69,490	1,161	953	15·52	13·71	16·55	13·91	16·5	14·4

These figures point to a mortality which is, on the whole, more favourable to the Jews than is shown by London, and especially in Stepney. Compared with London, the Jewish death-rate at ages up to about 15 in the case of males, and 5 in the case of females, works out to an appreciably higher figure. At all other ages up to 75 the Jewish death-rates are uniformly and sometimes considerably smaller. Thus at age groups 25—34, the Jewish death-rate for males is 4·59, while the general death-rate was 5·81. The death-rate shown at ages 35—44 is so very much below the general death-rate, and is, further, the only instance where the male exceeds the female death-rate, that I think there must be some error possibly in the estimated population at these ages.

I have had the temerity to attempt to re-state the figures I have given in the preceding pages in the form of a life-table for the Jews of London. While I am fully aware of its many defects, mainly on account of the uncertainty attaching to the numbers living and dying at various ages, and because of the figures for deaths applying to 1 year only, I still thought it worth while to go through the working enjoined in Dr. Hayward's modified Farr's method, because the result expresses most conveniently—in a single figure in fact—all the phenomena of living and dying. I believe I have mitigated the severity of some of the main objections which can be urged, by distributing the actual deaths of children under 5 not according to the ages in which they are returned as having taken place, but in accordance with the average of the previous five years. The number of lives at risk at all ages, except under 1, have been taken as those actually calculated above. For the number of lives under 1 I have taken the number of births, calculated as in the next section, and assumed that the numbers of male and female births are equal. At all other ages and groups of ages I have assumed the calculated number of lives is equal to the actual mean number of lives at risk in those ages. The error is only that which is common to the whole of the calculations in the present paper. In the calculation of the years lived I have taken each ten-year period from 5 to 55 in two equal age-groups, each ten-year period from 55 to 85 in four equal groups, and annually at ages 85 and upwards. While I am fully conscious of the many drawbacks and sources of error, I give the result of these calculations because it embodies, as I have said, all the other figures which have been so submitted.

TABLE XIV.—*Number Surviving at Different Ages out of 10,000 Born, compared with certain other Classes.*

Ages.	Jews, 1903.		London, 1891-1900.	
	Males.	Females.	Males.	Females.
0	10,000	10,000	50,911	49,089
1	8,374	8,767	41,538	41,514
2	7,838	8,279	38,809	38,984
3	7,711	8,137	37,737	37,931
4	7,622	8,065	37,060	37,253
5	7,567	8,017	36,604	36,786
15	7,358	7,836	35,279	35,418
25	7,126	7,688	33,884	34,301
35	6,806	7,368	31,434	33,518
45	6,473	6,773	27,223	29,059
55	6,218	6,047	21,497	21,408
65	4,630	4,757	14,135	17,757
75	2,893	3,090	6,211	9,127
85	389	894	1,129	2,079

The number of survivors out of 10,000 Jewish males at birth at age 5 is 7,567; the number for London generally is 7,189. At age 45 the number of Jewish male survivors was 6,473; for London generally the number is 6,174. The number of female survivors out of 10,000 at birth is in the case of the Jews 8,017 and 6,773 respectively, and 7,494 and 5,940 in the case of London generally. Thus at all ages and for both sexes, especially for females, the number of survivors among Jews is greater than represents the general London experience.

Perhaps still more conveniently the vital properties of London Jews are expressed by the following table, showing the estimated expectation of life at various ages :—

TABLE XV.—*Expectation of Life for Jews of London (1903), and for London (1891-1900).*

Ages.	Jews.		London.	
	Males.	Females.	Males.	Females.
0	49·44	52·04	40·98	45·33
1	57·95	58·30	49·15	52·53
2	60·89	60·71	51·57	54·91
3	60·87	60·75	52·02	55·42
4	60·57	60·28	51·96	55·42
5	60·02	59·65	51·60	55·12
15	51·58	50·82	43·40	47·10
25	43·10	41·79	34·96	38·46
35	34·61	33·39	27·25	30·42
45	26·13	25·83	20·65	23·29
55	17·00	18·34	14·76	16·72
65	11·18	12·05	9·76	11·01
75	5·11	6·03	5·91	6·57
85	4·32	3·71	3·18	3·75

At all ages the Jewish expectation of life is greater than for non-Jews. The greatest difference is at 2 years old, when the Jewish boy has an expectation 9·32 years greater than his non-Jewish comrade. A rather remarkable result is that at all ages between 2 and 45 the Jewish female expectation is slightly less than the male.

It is not my purpose, nor have I the necessary materials to enable me to account for these striking differences, which are common not only to the life-tables given above, but also to the American experience as given in the Census Bulletin to which reference has been made. One important cause of death is at least absent from Jews, which is responsible directly or indirectly, or in accelerating a comparatively large number of deaths among non-Jews: this is alcoholism, which is notoriously absent from the Jewish community. Longevity may be racial; it certainly is increased by the abstemiousness of the Jewish mode of living, and the restrictions imposed on his ordinary dietary.

Birth-Rates.

Any attempt at estimating Jewish birth-rates must necessarily be based on totally indirect methods. There is no return of Jewish births in the least adequate for the purpose. In some synagogues a register of male-births is kept, but the cases where this is so are so few that they can hardly be regarded as suitable material for working on. Thus all avenues of direct approach are effectually closed, and we must be content with an indirect, roundabout, and somewhat tortuous method. By assuming that the non-Jewish population of Stepney had statistical properties as regards age and sex composition identical with those prevailing in the aggregate of the boroughs of Shoreditch, Bethnal Green, Bermondsey, and Southwark, figures were obtained giving the non-Jewish population of Stepney at different groups of ages. It would seem not unreasonable to assume still further that the number of non-Jewish females between the ages of 15 and 45 would give birth annually to about the same number of children as in the aggregate of the boroughs mentioned. This conclusion is strengthened by observing how closely the various birth-criteria approximate to each other in the various boroughs. (Table XIV.)

TABLE XVI.—*Birth-rate in Undermentioned Boroughs in 1903 per 1,000 Living, per 1,000 Married Females Aged 15—45, and per 1,000 Females Aged 15—45.*

	Birth-Rate per 1,000 Living.	Births per 1,000 Married Females Aged 15—45.	Births per 1,000 Females Aged 15—45.
Bermondsey	32·5	256	134
Bethnal Green	35·7	281	149
Shoreditch	33·5	257	135
Southwark	32·5	242	134
Mean	33·5	259	138

It will be seen that the average deviation from the mean of the figures in each of the above columns is from 3 to 5 per cent. Hence, whatever criterion be applied, the number of non-Jewish births in Stepney in 1903 works out to 5,939, leaving 5,390 as the probable number of Jewish births. The last figure works out to a birth-rate of 45·0 per 1,000 Jews and to 189 per 1,000 Jewish women aged 15 to 45, and again to an annual birth-rate of 364 per 1,000 married Jewish women aged 15 to 45. The last result is based on the assumption that the non-Jewish population of Stepney contains a normal proportion of married women. This would give 22,900 non-Jewish and 14,833 Jewish married women at ages between 15 and 45. This would appear to point to the fact that the Jewish birth-rate, which is undoubtedly higher than the general birth-rate, is not accounted for by the fact that the proportion of unmarried women between the ages of 15 and 45 is probably considerably smaller among Jews than among non-Jews. The comparison with the number of married women at child-bearing ages points rather to a considerably greater fertility among Jewish women.

Infant Mortality.

No question of Jewish vital statistics has had more attention paid to it than that of child mortality. It is universally agreed by all the medical officers with experience of Jewish districts that in such districts the infant mortality is remarkably small. Sir Shirley Murphy, in his evidence before the recent Alien Commission, put in a table of which the following is a summary:—

TABLE XVII.—*Deaths Under 1 Year of Age per 1,000 Births in Stepney, Southwark, and London.*

	1886-90.	1891-95.	1896-1900.
Whitechapel	170	158	144
St. George's-in-the-East	195	190	181
Limehouse	191	187	204
Mile End Old Town	147	154	155
Borough of Stepney	170	168	165
.. Southwark	172	181	186
London	153	156	161

According to these figures the deaths under 1 year per 1,000 births fell steadily in the districts of Whitechapel and St. George's-in-the-East, where there was known to be a steady influx of Jews; but rose steadily in the same time in Limehouse and Mile End, where the number of Jews is smaller, and increased considerably in the borough of Southwark and in London generally. Between 1886-90 and 1896-1900 the infantile mortality fell by 15·3 per cent. in Whitechapel and by 3·0 per cent. in the whole borough of Stepney; whereas the rise in Southwark amounted to 8·1 per cent. and in London generally by 5·3 per cent. These differences, not alone in magnitude, but also in the course of the infantile mortalities in the Jewish and non-Jewish districts, can only be attributed to the more favourable Jewish rates. Sir Shirley Murphy ascribed to the aliens (*i.e.*, Jews) in Stepney the high qualities of abstemiousness, of showing greater care for their children, of themselves, and their mode of life. Dr. D. L. Thomas, Medical Officer of the borough, referring to the same question, attributed the low infant mortality prevailing among Jews to the fact that Jewish mothers more often suckle their own children, the result of this cause alone being to diminish infantile deaths from diarrhoea to one half.

The figures put in by Dr. Niven, Medical Officer for Manchester, are even more striking in their evidence as to the extraordinarily low infant mortality in the districts largely inhabited by Jews. Of all the statistical districts into which the city of Manchester is divided, the infantile death-rate in each of the years 1898-1901 was lowest in the Cheetham district. In 1897 it was the next lowest. In 1898 the figures were 196 for the whole city, and 122 for Cheetham; in 1899 they were 205 for the city and 104 for Cheetham. Thus in the chief Jewish district of Manchester the infantile death-rate was only from 50 to 60 per cent. of the rate throughout the whole town. The figures given in the preceding

pages absolutely confirm these conclusions by indicating a very low infant mortality among the Jews of London. The number of births in 1903 was estimated at 6,487 for the whole of London; the number of deaths under 1 year was 831. This gives an infant death-rate of 128 per 1,000 births in 1903, a figure which is just below that for the whole of London (130 per 1,000). The rate for Stepney in the same year was 138, in Bethnal Green 141, in Shoreditch 171, in Southwark 148, in Bermondsey 158, and in Chelsea 142. I venture to think that this result is in such complete harmony with the results of other observers in districts containing a large proportion of Jews, as to justify a fairly large measure of confidence in the method and the reasonableness of the assumptions which form the basis of what is original in the present paper.

Marriages and Marriage-Rates.

The question of Jewish marriages raises some difficulties of a novel character. The only records which exist are of "marriages according to Jewish rites," and these are certainly less than the number of marriages of Jews or of persons defined as Jews at the beginning of this paper. It is known, for example, that certain Jewish marriages take place before the Registrar; others, at which one of the party is Jewish, in churches. On the other hand, a certain number of the marriages in a synagogue are of parties in which one is non-Jewish. Then, again, the effect of immigration should not be lost sight of, inasmuch as it diminishes the actual number of marriages in the Jewish population by the number of marriages less than one year old celebrated abroad among the immigrant Jews. It is known also that a certain number of so-called illicit marriages take place annually among the poorer classes of Jews, by those who cannot afford to pay the usual synagogue charges. Though this last factor has been considerably reduced in recent years by the joint action of the United Synagogue and the London Committee of Deputies of British Jews, yet I feel certain that these marriages continue to be common, especially in the case of re-marriages. All these factors, though some act in opposite directions, cast an element of uncertainty about the calculations.

There are two returns of Jewish marriages which, though ostensibly dealing with the same facts, differ appreciably from one another. The first is that of the Registrar-General, and is given annually in his report; the second is that of the London Committee of Deputies of British Jews, a body founded in 1760, and which in recent years has been made responsible for nominating eligible men

to act as special marriage registrars in synagogues throughout the United Kingdom. These marriage registrars return annually to the Board of Deputies the number of marriages celebrated in their synagogues, and since the totals are found nearly always to differ in excess from those of the Registrar-General, the difference is probably due to the re-marriages of those who previously were married either by the Registrar or in a non-Jewish place of worship. The extent of these differences is seen in the following table:—

TABLE XVIII.—*Jewish Marriages in England and Wales during 1894-1903.*

Year.	London.		England and Wales.	
	According to Registrar-General.	According to Board of Deputies.	According to Registrar-General.	According to Board of Deputies.
1894	794	839	1,129	1,160
'95	811	864	1,214	1,272
'96	885	963	1,252	1,346
'97	1,002	937	1,429	1,369
'98	1,054	1,096	1,445	1,486
'99	1,192	1,250	1,666	1,699
1900	1,187	1,263	1,669	1,751
'01	1,287	1,331	1,813	1,863
'02	1,417	1,478	1,944	2,004
'03	1,386	1,431	1,894	1,932

In the last ten years the Board of Deputies' totals have exceeded, except in 1898, those of Somerset House. The average annual difference in the case of London is about 4 per cent., in one case of England and Wales about 2·77 per cent. The fact that the difference in the figures for London is greater than for England and Wales is due probably to a want of agreement in the areas comprised under the head of London in the two returns.

Confining our attention to the Registrar-General's figures, the number of Jewish marriages in London was 1,386, which is at the rate of 9·6 marriages, or 19·2 persons married per 1,000 of the population. This gives a rate of 18·5 per 1,000 males and 19·9 per 1,000 females at all ages. The marriage-rate for the whole of London in 1903 was 17·4 per 1,000 living, and 18·5 per 1,000 males and 16·3 per 1,000 females. A better and truer comparison of the proneness to marriage in the two groups would be to take the proportions of persons married per 1,000 of the population liable to marriage, that is, after excluding from both the persons under 15. The result is given in the following table:—

TABLE XIX.—*Marriage-Rate among Jews and in London per 1,000 All Ages and per 1,000 Aged 15 and Over, 1903.*

		Jews.	London.
Per 1,000 all ages	Males	18·5	18·5
	Females	19·9	16·3
	Both sexes	19·2	17·4
Per 1,000 aged 15 and over	Males	28·4	27·1
	Females	31·7	22·8
	Both sexes	30·1	25·0

The marriage-rate, which for males at all ages is the same among Jews as for the general population, is seen to be greater by nearly 5 per cent. when only the males over 15 are taken into account. The female marriage-rate at all ages is 22 per cent. higher, and at ages 15 and upwards is 39 per cent. higher than for the whole of London. Of those aged 15 and over, 1 in 35 males and 31 females are married annually among the Jews; in London generally the proportions were 1 in 37 males and 1 in 44 females. I have not at present any data enabling me to eliminate from the Jewish marriages the number of re-marriages. It is probable that if this could be done the difference in the rate of first marriages would be very considerably greater even than is shown above. It should be noted that the exceptionally low mortality among adult Jews would tend to make the average age of the widowed at the time of the deaths of their spouses appreciably higher among them. This in itself, even if no other cause were active, would tend to diminish the number of Jewish re-marriages. Neither are there any data as to the mean age of first marriages among Jews, but the materials for the complete study of marriages exist in abundance at Somerset House, and these I hope to attack at an early date.

The materials do not exist in a sufficiently suitable form to permit any measurement of the fertility or fecundity of Jewish marriages being made. For this the births as well as marriages must exist in a continuous record for a series of years.

Jewish Population of the United Kingdom.

Two methods may be employed to determine the total Jewish population of the United Kingdom. The first would assume that the marriage-rate is the same throughout the United Kingdom as it is in London. In the second it may be assumed that the proportions between natives of Russia, Poland, and Roumania bear the same proportion to the total Jewish population as in London. The result by each of these two methods as applied to the various divisions of the United Kingdom is as follows:—

TABLE XX.—*Total Jewish Population of the United Kingdom.*

	First Method.	Second Method.
London	144,300	144,300
Rest of England and Wales	54,000	81,400
Total England and Wales	199,200	225,700
Scotland	18,300	27,250
Ireland.....		6,100
Total United Kingdom	217,500	259,050
Mean	238,275	

Considerable differences appear in the results obtained by these two methods. I believe the second result to be too high, because the non-Jewish Russians and Poles exist in larger proportion to all natives of these countries in towns outside London than in London. Thus in Scotland and in Lancashire it is known that a considerable contingent of Christian Poles live. The mean of the two results is likely to be very near the true figure, and I think it may fairly reasonably be taken that the mean Jewish population in 1903 was just under 240,000.

Rate of Increase of Jewish Population.

There remains finally the interesting question of the rate at which the Jewish population of the United Kingdom is growing. This I deem can be best done with the materials available from the marriage returns. If we take either the Registrar-General's or the Board of Deputies' returns, the average number of marriages during 1899-1903 exceeds those of 1894-98 by 39 per cent. This represents an average rate of increase of 6·8 per cent. per annum, and will include, besides the natural increase due to excess of births over deaths, the net annual increase due to excess of immigration over emigration. In 1903 the London Jewish death-rate was 14·66 per 1,000, and the estimated birth-rate about 45·0 per 1,000. This gives for the natural increase the rate of nearly 3·1 per cent., and hence for the net immigration the figure of 3·7 per cent. per annum. The first implies a mean annual increase of 5,080; the second an annual increase of 6,070. In the future it may be expected that the second will diminish, while the first is certain to increase.

Conclusion.

If any merit attaches to the present contribution it will be found, I believe, in the success which has attended the attempt to use official and well-known materials. With the exception of the

United Synagogue returns of deaths I have made use only of such returns as the census, the annual returns of the Registrar-General, and evidence given before the Alien Commission. These have been found to yield results based on certain assumptions which appear to me eminently reasonable. The consistency of the conclusions which have followed confirms the approximate truth of these assumptions.

The principal conclusions which have been reached in the present contribution may be summarised as follows:—

- (i.) The death-rate from all causes and at all ages, except 0—5, is lower among Jews than non-Jews in London.
- (ii.) The birth-rate is considerably higher.
- (iii.) The infantile death-rate, in proportion to number of births, is very low.
- (iv.) The expectation of life at all ages for both sexes is higher.
- (v.) The marriage-rate is higher.
- (vi.) The rate of natural increase is higher.
- (vii.) The present Jewish population of the United Kingdom is about 250,000.

APPENDIX.

*Statement of Burials in Jewish Cemeteries of Glasgow (excluding Still-Births) during Years 1899 to 1904 (inclusive).**

Ages.	MALES.						FEMALES.					
	1899.	1900.	1901.	1902.	1903.	1904.	1899.	1900.	1901.	1902.	1903.	1904.
0—	19	19	21	25	20	21	10	8	20	19	19	15
5	—	2	1	1	—	4	2	4	1	2	1	1
15—	2	1	3	1	2	3	1	2	1	2	1	2
25—	1	3	4	1	3	4	2	1	3	2	2	2
35—	1	1	—	4	1	2	2	—	—	—	4	4
45—	—	1	3	2	5	3	1	1	1	3	1	1
55—	—	—	—	3	5	3	—	—	1	6	1	3
65—	1	—	5	2	1	—	2	3	2	6	2	1
Unknown	—	—	1	1	5	4	—	—	—	—	4	5
All ages....	24	27	38	40	42	44	20	19	29	40	35	34

* The figures in this table have been kindly extracted by Mr. C. B. Mabon, from the books of the United Synagogue of Glasgow. They are stated to cover the same area of population throughout the whole of the period given.

*Statement of Burials in Jewish Cemeteries of Manchester belonging to the
Old Hebrew Congregation and Congregation of British Jews.**

Ages.	MALES.						FEMALES.					
	1899.	1900.	1901.	1902.	1903.	1904.	1899.	1900.	1901.	1902.	1903.	1904.
0—	41	45	44	10	14	16	32	44	42	8	7	9
5—	2	4	—	2	2	1	1	—	5	—	—	1
15—	2	2	4	1	—	3	4	4	8	2	5	4
25—	3	2	8	—	—	3	4	8	4	1	2	3
35—	2	5	2	—	4	1	3	3	6	1	1	3
45—	2	3	4	2	6	3	4	4	5	1	—	2
55—	6	11	5	5	4	1	5	5	6	5	1	6
65—	9	14	22	6	3	4	11	9	14	2	4	11
All ages....	67	86	89	26	33	32	64	77	90	20	20	39

* From figures kindly furnished by the secretaries of the respective Congregations. In addition to these Congregations there are several other institutions responsible for burying the Jewish dead in the Manchester district. The figures obtained from them were however insufficient, or obviously inaccurate.

DISCUSSION *on* MR. S. ROSENBAUM'S PAPER.

THE PRESIDENT (SIR FRANCIS SHARP POWELL) expressed the gratitude of the Society to the reader of the paper, who had given such valuable information, although he had at command but a meagre supply of materials. Anything connected with the Jewish race was of great interest. The Jews had lived amongst the nations of the world, amidst them but not of them, and had persisted generation after generation amidst hardships and persecutions of an eminently unchristian character, which they had borne for the most part with exemplary patience and forbearance. It was always interesting to investigate the causes of this absolutely unique phenomenon, some of which had been detailed to-day, and amongst them the leading of a good life. It was clearly shown that the Jewish population for the most part lead lives of sobriety, and their dietary was of such a character as to conduce to the maintenance of health and the prolongation of life. The material causes had been indicated in the paper, but there were other reasons and other causes behind. They had on the one hand the extraordinary vitality of the physical frame and on the other the intellectual force of the Jewish mind. Those conditions had acted continuously, though probably with varying force in different

ages and in different countries, but perhaps one of the most supreme causes of the endurance of this wondrous race was the eminent charity they had always shown towards one another, and the mutual helpfulness and kindness displayed to brethren in distress.

Mr. J. H. LEVY said that in all statistical calculations, the determination of the unit was a matter of primary importance; and that the chief interest of the paper for him centred in the definition of "Jew." The definition employed by Mr. Rosenbaum was that a Jew was "one who, when he dies, is buried in a Jewish cemetery." This had not surprised him. It had been used years ago by the editor of the *Jewish Year Book*. But he took exception to it for several reasons. First, it employed the term "Jewish cemetery," of which the adjective involved the term requiring definition, and thus was reduced to the vacuous statement, a Jew was a person who was buried where Jews were buried; and, secondly, it was a highly artificial method to try and distinguish a living race by a *post-mortem* religious test.

But, even apart from these objections, there remained the fact that Mr. Rosenbaum did not keep to his definition when he had made it. In fact he hardly again referred to it. He mentioned Jewish agnostics, Jews who were married in church or before a registrar; and in these cases he would surely not maintain that the classes in question would necessarily find burial in a Jewish cemetery. Similar reflections might be made on his summarised conclusions.

The salient facts of vital statistics of a race could not be made dependent on a definition relying for its validity on their place of burial. It would have been much more satisfactory to have adopted a definition, however defective, based on some racial characteristics than the one actually employed. This would at least have rendered intelligible the connection between a community so defined and the various statistical facts adduced with respect to them.

In his opinion, however, their thanks were due to Mr. Rosenbaum for his endeavour to open up a new field of statistics, hedged round with difficulties as it was, and lacking in reliable material.

Mr. NOEL HUMPHREYS said he thought they owed a debt of gratitude to Mr. Rosenbaum for the courage and ingenuity he had displayed in producing a valuable statistical paper without many definite facts upon which to base his conclusions. He doubted, however, whether he had not carried ingenuity a little too far in calculating a life table from the conclusions at which he had arrived on the facts at his disposal. As regarded infant mortality among the Jews, Mr. Rosenbaum had apparently good ground for rehabilitating the Jewish mother as exceptionally careful of child life, and he thus supported the general impression of medical officers of health and of other persons who had been brought into connection with Jews in different parts of London. His assertions of the low rate of infant mortality among the Jews were indeed based upon facts

really beyond dispute. It was a remarkable fact that in the registration districts of Stepney, Whitechapel and St. George's-in-the-East, where Jewish aliens had recently settled in such very large numbers, the death-rate of infants, although still high (owing to the conditions of life in those parts), showed a steady and continuous decline during the three quinquennial periods from 1886 to 1900, although in the remaining districts of East London infant mortality had unfortunately shown a steady increase. It was, he thought, a fair assumption that the decline of infant mortality in Stepney, St. George's-in-the-East and Whitechapel was due in great measure to the large and increased proportion of Jewish mothers resident therein. Regret was expressed in the paper at the non-existence in England of a religious census as a means for ascertaining the number of Jews as a basis for the calculation of Jewish vital statistics. Considering, however, what they had heard as to the difficulty of defining a Jew, he was not individually very sanguine that a religious census would yield very trustworthy figures. It must moreover be borne in mind that even if a religious census were to show how many people calling themselves Jews were living in the country, it would also be necessary to obtain similar information from the birth and death registers, showing the religious persuasion of the parents of children and divorced persons, in order to obtain a thoroughly sound basis for such vital statistics of the Jews as the reader of the paper had evolved from somewhat unsatisfactory data.

Mr. A. WEINER said he had had the privilege of seeing a proof of the report for the year 1904 of the Medical Officer of the borough of Stepney, from which he had extracted some remarkable figures elucidating some of the points raised by Mr. Rosenbaum. The medical officer, Mr. D. L. Thomas, investigated 104 groups of model dwellings chiefly occupied by Jews, the total population comprised in these dwellings being 26,089. Of this population 18 per cent. was under 5 years of age, this figure comparing with 15 per cent. for the whole borough, so that consequently the age distribution in these model dwellings would be less favourable to a low death-rate. The larger the number of children under 5 the higher should be the death-rate, but, as a matter of fact, the death-rate of these dwellings was 15·3 per 1,000 as against 19·5 in the whole borough of Stepney, while the infant mortality, 141 per 1,000, was pretty consistent with the number quoted in the paper, 138, being nearly 18 less than for the whole borough. One fact to which Dr. Thomas also called attention must be taken into consideration, that in model dwellings fatal accidents to children under 5 were likely to be more numerous, on account of the staircases. The figures as to infant mortality compared remarkably well with a portion of the Royal Borough of Kensington, Notting Dale, where the infantile mortality for 1899 was 508 per 1,000, the average for the years 1896, 1897, 1898, 1900, 1901 and 1902 being over 400. The report of Dr. Thomas also contained some figures as to age

distribution, but, unfortunately, he had adopted different groups, and he had not had Mr. Rosenbaum's paper before him so as to be able to work them out on similar lines: under 1 year the number was 1,034 out of 26,089; between 1 and 5 it was 3,700; between 5 and 20, 9,077; between 20 and 40, 8,310; between 40 and 60, 3,341; and above 60, 627. This report, which in a sense had taken the place of an actual religious census, though of course for a very small proportion of a district, bore out almost to the letter the ingenious calculations of Mr. Rosenbaum, which were not at all so exact as those of the medical officer, and it showed that although Mr. Rosenbaum might have made assumptions which were not warranted by the facts before him, yet where they were so warranted his general results were in no way impaired.

Mr. A. H. BAILEY said he had been exceedingly struck by the ingenuity exercised by Mr. Rosenbaum in getting out the results at which he had arrived, but a Statistical Society ought to be very cautious about accepting results, however ingeniously obtained, when what they wanted were actual facts. The definition which had been given of a Jew was rather amusing, but what he supposed Mr. Rosenbaum meant by the definition was a man who intended to be buried in a Jewish cemetery. In mortality investigations obtained in such a way the main difficulty was in arriving at the number living with which the deaths were to be compared, and it would appear that Mr. Rosenbaum himself felt that difficulty, where he said: "The death-rate shown at ages 35—44 is so very much below the general death-rate, and is, further, the only instance where the male exceeds the female death-rate, that I think there must be some error possibly in the estimated population at these ages." That abundantly showed the necessity of care in adopting these figures before the actual facts were obtained. In the Jewish community, as had been found in other mortality investigations, the number of deaths probably did not compare with the population of the district, so that taking the number of deaths to the whole population was the only way of getting at the law of mortality. The paper was of very great importance and interest, and the Society was much indebted to the author for the information which it contains.

Professor F. Y. EDGEWORTH adverted to a peculiarity in Jewish vital statistics—the fact that the excess of male over female births was greater in the case of Jews than for the general population. That this was a fact, and not a mere appearance incident to paucity of observations, seemed to have been established by Duesing in his important study, *Das Geschlechtsverhältniss der Geburten in Preussen*.¹ What was the cause of the fact? According to one hypothesis, the abnormal excess of male births was a characteristic of races free from admixture; and the Jewish race belonged to that

¹ But see the statistics adduced by Körösi in the *Bulletin de l'Institut International de Statistique*, tome xiv, livr. 4.

class. After considering other explanations, the speaker remarked on the paradox that the subject most amenable to the mathematical methods of statistics—the proportion between the sexes at birth—was that in which the discovery of general laws had made least progress.

MR. DAVID PAULIN said it was not the first time that a writer had had to infer statistics of the living from the mortality tables. A similar process was adopted in the times when Dr. Richard Price framed his Northampton tables, and Dr. Price and Mr. Rosenbaum seemed to have worked very much in the same circumstances, having few statistics to guide them, and while the inferences could not be exactly right, they were certainly ingenious and most useful in the existing state of information.

MR. F. S. SPIERS said Mr. Rosenbaum was the first man who had endeavoured to treat scientifically the statistical problems connected with the Jewish people; hitherto these had been treated in a most haphazard manner. As to Mr. Rosenbaum's definition of a Jew, it was of course a perfectly logical one from the statistical standpoint, open to no possible misapprehension. In the Jewish community more deaths were recorded than any other circumstances attending the lives of its members. As therefore maximum records of these personal events occurred at death, it was legitimate to take the records of deaths as a criterion in determining the population. There were doubtless, on the other hand, many more Jews than were deduced from these statistics. He was inclined to believe that the number of Jews who were not even buried in Jewish cemeteries was considerably underrated. Mr. Rosenbaum's definition, however, was a rigidly scientific one, and was not tautological as implied by Mr. J. H. Levy. A Jewish cemetery was well understood as being a cemetery under the jurisdiction of the Synagogue. It was a well-known definite object, and the use of the expression "Jewish Cemetery" did not require further definition. As to the male birth-rate being proportionately higher than the female birth-rate amongst the Jews, it might be of interest to mention that the Rabbis of the Talmud considered that the observance of the Levitical laws relating to sexual separation at certain periods was favourable to the conception of male children. An important fact pointed out by Mr. Rosenbaum in connection with the newly arrived immigrant Jew was that "his dependents are considerably fewer, and his expenses necessarily smaller," and this, he said, was "a potent factor in mitigating the pressure of the earlier years of his sojourn here, and increasing his competitive power in the labour market." Such an extremely important fact might be used as an argument against those who said that the immigrant lowered the standard of life amongst the native population. As a matter of fact he did not lower the standard of life, which, in truth, was higher than that obtaining amongst corresponding classes of the native population. The fact pointed out by Mr. Rosenbaum was in itself sufficient to explain why the

initially-destitute immigrant was able to spend the first years of his sojourn here under conditions of life and comfort that compared not unfavourably with what even the average Englishman understood by "a decent standard of living." The statement as to this comparative absence of dependents increasing the competitive power of the immigrant in the labour market ought perhaps to be qualified. Those acquainted with the industries in which the alien immigrant engaged, knew quite well that he did not compete to any extent with native labour. He brought his own trades with him, and to those devoted himself entirely, so that his competitive power meant competitive power amongst his fellow aliens and was not relative to native labour.

Mr. J. A. BAINES said he welcomed the paper as the first fruits of a newly formed Society for the collection of statistics relating to a community in regard to which such information had not been hitherto available. He thought that the definition of Jew should refer, as far as possible, to distinctive features of personal and domestic life, because these were the most closely connected with the vital statistics under investigation. Race was, no doubt, a leading characteristic, but, as had been indicated, it was liable to be obscured or neutralised by other factors. In regard to a question raised by Professor Edgeworth, he was by no means sure that purity of race invariably tended to result in an unusual proportion of boy births. In India, for example, the Rajputs, a large community of undoubted purity of lineage, attached extreme importance to male progeny, and he thought that even from birth that sex predominated in number. But, on the other hand, there were the larger forest tribes of India, of equally unmixed lineage, but without special preference for male offspring, who showed, even, he thought, from birth, a preponderance of females. As to the lighter burden which Mr. Rosenbaum seemed to think gave the London Jew an advantage in competition for employment, there seemed evidence, according to the astonishingly high rate of natural increase shown in the tables, that it would be of a temporary character, since it could only be maintained by one of two influences keeping pace with that rate, viz., either the continuous influx of unmarried adults, or, as was the case in every other instance of abnormally high birth-rate, the rise of an abnormally high death-rate. He was not satisfied, however, that these rates, which the author had modestly put forward as more or less conjectural, were not in certain points inadequate or inaccurate as to the age return. Even if it were otherwise, the marked difference between the rates and those which prevailed amongst the surrounding population of indigenous race could only last to the extent to which the rapidly growing community which furnished them kept itself aloof from the domestic customs, standards and general life of the larger body in the midst of which it dwelt and laboured. In this country no industrial body of alien race had hitherto succeeded in escaping practical assimilation, and it was difficult to anticipate, therefore, the immunity of the Jew from the same influences.

Mr. ROSENBAUM in replying said that since there had been a large immigration in addition to a high rate of natural increase, the proportion of the Jewish to the total population must have increased. At the present time the age distribution of the Jewish population was favourable to an excessively high birth-rate as well as to an excessively low death-rate. The rate of natural increase was therefore abnormally high, but as the distribution of age and sex became more normal, the community would settle down to a smaller and more natural rate of increase. Mr. Rosenbaum regretted the discussion which had taken place round his definition of a Jew. He was not sure that the difficulties were so great as had been represented. What they desired to know was the death-rate for a given population. The definition adopted in the paper was a practical one dictated by the necessities of the case—by the object to be attained and the materials that were available. It might be that some other definition would comprise a larger number of Jews, but no materials whatever would then be available which could be correlated. The natural criterion to be applied to the usefulness of his definition was the degree of correlativity between the estimated number of Jews in the paper and the number of deaths in Jewish cemeteries. He was aware that the definition was useless if it were to be applied individually, but he submitted that it was perfectly satisfactory when applied collectively. The metaphysical and casuistical objection to the definition attained was readily met by substituting for Jewish cemeteries, cemeteries A, B, C, &c. He thought the difficulties as to a religious census were not altogether insuperable: it was at any rate common in most other continental countries, as also in the registration of births and deaths. Mr. Humphreys had correctly stated a religious census would be useless for statistical purposes without the corresponding figures for Jewish births and Jewish deaths returned by the same office. He admitted that the paper contained much that was conjectural, and necessarily so, the materials being so few and so inadequate. He had therefore entitled the paper not “Vital Statistics,” but “A Contribution to the Study of Jewish Vital Statistics.” A careful examination of the paper would show that there was virtually but one main assumption underlying all the calculations in the paper, and that was the similarity as regards age and sex distribution of the non-Jews in Stepney and of the population of four similar boroughs in which the number of Jews was known to be small. In reply to Professor Edgeworth, he had no information as to the relation between male and female births. In answer to Mr. Spiers, he would point out the reaction of one trade on another might be affected whether those trades were followed by Jews or not. If there were any advantage to non-Jews in following trades usually practised by Jews, then non-Jews would enter those trades.

The following were elected Fellows of the Society:—

Cohen, Charles Waley, M.A.		Seyd, Richard E. N. J.
Wadia, N. P. N.		

MISCELLANEA.

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I.—*The Statistics of Wages in the United Kingdom during the Last Hundred Years. (Part XII.) Engineering and Shipbuilding. C. Statements of Wages from Non-Trade Union Sources in Shipbuilding and Engineering at Shipbuilding Centres.* By A. L. BOWLEY, M.A., and GEORGE H. WOOD.

IN Part X of this series (*Journal*, March, 1905) Trade Union Standard Rates were tabulated for engineering and shipbuilding; in Part XI (*Journal*, June, 1905) information arising from other sources was tabulated for engineering in inland towns; in the present part similar information is given for engineering and shipbuilding in towns where both industries are carried on. The districts here dealt with are London (p. 566), the Clyde (p. 572), the North-East Coast (p. 584), Hull (p. 596), Dundee (p. 601), Belfast (p. 604), the Mersey (p. 608), and Barrow (p. 612). The Government dockyards will be treated in a following part, together with such information as we have for railway centres, and subsidiary matter, and it is hoped that the articles will be treated as a whole, index numbers formed and conclusions drawn in March, 1906.

Except in the case of London, separate tabulations are given for engineering and shipbuilding; but the industries are so closely connected that it seems advisable to put the tables in close juxtaposition, and to treat them together in the supplementary notes. In many cases statements are made by the authorities we quote which apply equally to engineering and shipbuilding, and in many

others the dates and nature of changes in shipyards afford a good indication of the changes in kindred occupations in engineering shops in the same district. In recent years there have been deliberate equalisations of rates in the two industries, *e.g.*, North-east Coast, engine shop plumbers, July, 1893, reduced 6*d.*, making the rate the same as that for ship plumbers, who were reduced by 1*s.*

Though our information as to the nominal time-wages of some classes of workmen is practically complete from the first date of the tabulations, there remain some almost insuperable difficulties in completing the estimates of changes in earnings. A very large proportion of iron shipbuilding is done on piecework: in the early days of the industry the employers engaged and paid the platers' helpers, but in more recent years the platers in most shipyards employed and paid their own helpers, who, while obtaining a higher daily wage than ordinary labourers, did not necessarily make more in the week; more recently still the standard wages for platers' helpers have been fixed by agreement between the organisations of the platers and their helpers, and these are one-third to one-half higher than the wages of ordinary labourers or of helpers working at a time-rate.¹ It is very difficult to collate these statements; the "black squad" of angle-iron smith, rivetter, plater, helper, and holder-up work at somewhat irregular hours,² which do not amount, even in busy times, to the 53 or 54 hours constituting a normal week's work on a time-rate basis. The amount so lost is unknown; and the employers (except where they pay the helpers with money deducted from the platers' earnings) have no record of the way in which the money they pay is divided between those they employ directly and indirectly. The same difficulty arises in dealing with anglesmiths' strikers, and, in some cases, even ordinary shipsmiths' strikers.

A second difficulty arises in the interpretation of statements as to changes in piece-rates. The estimates we have of weekly earnings on this basis are sufficient to show that they are very much higher than those of men doing similar work at time-rates. We have, indeed, good records of the percentage changes in recognised lists of piece-prices, but the means of connecting these with changes in earnings are in general wanting. Some help can be obtained by collating the list changes with changes in time-rates at the same time and place; this has already been discussed in Part X (*Journal*, March, 1905, p. 120).

In some cases there are tacit or written agreements connecting

¹ For an account of the relations between platers and their helpers, see a paper by J. Lynch on skilled and unskilled labour in the shipbuilding trade, in the Industrial Remuneration Conference Report, 1886.

² See evidence in Glasgow Housing Commission, p. 601. The reports of the Boilermakers' Society contain a number of complaints regarding the deliberate loss of time by members of the society. A return from Sunderland in 1883 gives the average hours worked as 50, and returns from Glasgow and Greenock in the same year show the piece-workers averaging about 48 hours, and the time-workers 54.

the dates of changes in different districts. At Barrow the engineers' wages change one month later than those for similar occupations on the Clyde, and the shipbuilders follow the Tyne. The Clyde is also followed, both by engineers and shipbuilders, at Belfast and the East Coast of Scotland. The ironmoulders' wages all over Scotland have recently risen and fallen together. Wages of engineers at Arbroath and Monifieth change with those at Dundee. The platers' and rivetters' lists for iron shipbuilding at Southampton provide that their rates shall be 5 per cent. below those on the North-east Coast, and follow their changes after a month's interval.

The following list, reprinted from Part XI of this series, shows the references indicated by the letters at the head of the tables :—

- A. *Returns of Wages.* C-5172, 1886, pp. 161—181, Engineering and Foundry Work.
- B. " pp. 181—190, Machinery.
- C. " pp. 201—207, Metal Ware and Brass Work.
- D. " pp. 209—223, Shipbuilding, Iron.
- E. " pp. 224—230, Shipbuilding, Wood.
- F. *Wage Census.* General Report. C-6889, 1893, Engineering and Machinery Works.
- G. " Iron and Steel Shipbuilding.
- H. *Webb Collection.* MS. Statement of Wages in the Chief Shipbuilding and Engineering Centres, and an account of Changes in Standard Rates on the North-east Coast since 1880.
- III. " Other Employers' Statements.
- I. Edward Young. *Labour in Europe and America*, 1878.
- J. U.S.A. *Consular Reports*, 1878.
- K. " " 1884.
- L. Reports of the *Labour Commission*.
- M. " Royal Commission on *Trade Unions*, 1867.
- O. " " " *Trade Depression*, 1883.
- P. Private Inquiries.
- Q. Clyde Shipwrights. *Report of Arbitration Proceedings*, 1877.
- R. Glasgow Municipal Commission on the *Housing of the Poor*, 1903. Minutes of Evidence.
- S. R. Montgomery. *Manchester in 1834 and 1884.* Manchester Statistical Society, 1884.
- SS. *Journal of the Statistical Society*, 1840, p. 412.
- T. Leoni Levi. *Wages and Earnings*, 1886.
- U. Sir T. Brassey. *Work and Wages*, 1872.
- V. " *Lectures on the Labour Question*, 1878.
- W. J. R. Macculloch. *Statistical Account of the British Empire*, 1846.
- X. Report of H.M. Inspector of Factories. H.C.—440, 1871.
- Y. Board of Trade. Reports on *Changes in Wages and Hours of Labour*, 1893-1903, and *Labour Gazette*, 1893—to date.
- Z. Returns of "Majority Rates," prepared by various Engineering Trades Employers' Associations, 1884, 1886, 1888, 1894, 1898; and of changes in standard time and piece rates at certain ports since 1876.

TABLE 1.—THE THAMES. *Time Wages for an Ordinary*

Year	1851 and 1861-65.	1863-66.	1865-69.	1869.	1869.	1872.		1877.	1884.	1884.	1886.	1886.
Authority	U.	U.	U.	U.	§	I.		†	Z.	Z.	Z.	L.
Class	—	—	—	—	Ship.	Engine.		Engine.	Ship.	Engine.	Ship.	Ship.
						Number.	Wage.					
	s.	s.	s.	s.	s.		s.	s.	s.	s.	s.	s.
Shipwrights	42 to 48	42	39 to 42	36 to 39	42	—	—	—	40/6	—	40/6	42
Ship-joiners	36 to 39	36	36 to 42	36 to 42	36	—	—	—	—	—	—	39
Ship-painters	—	30	—	—	—	—	—	—	—	—	—	—
Angle-smiths	38 to 40	—	38 to 40	38 to 40	—	—	—	—	42	42	—	—
Platers	36 to 42	40 to 42	36 to 42	36 to 42	42	—	—	42	42	40	—	44/6
Riveters	—	32	—	—	36	—	—	33	34	33	36	44/6
Caulkers	30 to 33	—	30 to 33	30 to 33	36	—	—	—	—	30	—	—
Chippers	28 to 30	30 to 33	28 to 30	28 to 30	—	—	—	—	—	—	—	31/6
Holders-up	—	—	—	—	—	—	—	—	18 ?	27	18 ?	—
Fitters	33 to 38	—	35 to 40	33 to 38	—	98	28 to 33	38	—	38	—	—
Turners	—	—	—	—	36	86	33 to 38	32 to 35	—	38	—	—
Erectors	—	—	—	—	—	—	—	—	—	38	—	—
Engineers	—	34 to 36	—	—	36	—	36 & up	—	—	—	—	—
Smiths	30 to 42	36	30 to 42	30 to 42	—	—	—	36 to 42	39	36	—	36
Strikers	22 to 24	22/6 to 24	22 to 24	22 to 24	—	—	—	—	25/6	24	—	25/6
Pattern-makers	36 to 39	36	39 to 42	36 to 39	36	16	38	31 to 38	—	39	—	—
Ironmoulders, sand	} 36 to 38	38	36 to 40	36 to 40	—	20	38	—	{	36	{	—
Ironmoulders, loam										37		
Planers	30 to 33	—	32 to 34	30 to 33	—	—	—	38	—	38	—	—
Shapers	—	—	—	—	—	—	—	—	—	38	—	—
Slotters	—	—	—	—	—	—	—	18 to 28	—	38	—	—
Borers	—	—	—	—	—	—	—	—	—	36	—	—
Machine-drillers	} 22 to 27	—	23 to 28	22 to 27	—	—	—	—	20 {	24	{ 22	—
Hand-drillers										22		
Screwers	—	—	—	—	—	—	—	—	—	—	—	—
Brass-moulders	—	—	—	—	—	20	36 to 42	—	—	38	—	—
Brass-finishers	—	—	—	—	—	—	—	—	—	36	—	—
Coppersmiths	—	—	—	—	—	10	38	—	—	—	—	—
Braziers	—	—	—	—	—	12	30 to 36	—	—	—	—	—
Joiners	—	—	—	—	—	—	—	—	—	—	—	—
Core-makers	—	—	—	—	—	—	—	—	—	—	—	—
Fettlers or dressers	—	—	—	—	—	—	—	—	—	—	—	—
Red-leaders	—	—	—	—	—	—	—	—	—	—	—	—
Sawmill men	—	—	—	—	—	—	—	—	—	—	—	—
Sawyers	—	—	—	—	—	—	—	—	—	—	—	—
Sail-makers	—	—	—	—	30	—	—	—	—	—	—	—
Boiler-makers	36 to 42	—	36 to 42	36 to 42	36	—	—	—	—	—	—	—
Plumbers	—	33	—	—	33	—	—	—	—	—	—	—
Painters	21 to 30	—	21 to 30	21 to 30	—	—	—	—	—	—	—	—
Angle-iron smiths' } strikers	—	—	—	—	—	—	—	—	—	25	—	—
Platers' helpers	21 to 24	—	21 to 21	21 to 21	—	—	—	—	18	—	—	—
Riveters' helpers	20 to 24	—	20 to 24	20 to 24	—	—	—	—	—	—	—	—
Boiler-makers' } helpers	21 to 24	—	21 to 21	21 to 21	—	—	—	—	—	21	—	—
Fitters' helpers	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	—	21	—	—	—	50	18 to 21/6	—	18	—	18	28/6
Labourers, foundry	—	—	—	—	—	—	—	—	—	20	—	23
Labourers, fitters	—	—	—	—	—	—	—	—	—	19	—	—

* Engineering and Shipbuilding have been put together in this way for reasons explained in the text.

(a) Many of the holders-up were very young men.

(b) Present standard time rates.

(c) 26s. in boiler shops.

*Week's Work in Engineering and Shipbuilding, 1851—1901.**

1886.		1886.		1886.	1886.	1888.	1890.	1890.	1894.	1894.	1897.	1901-5.
G.		F.		Z.	L.	Z.	L.	L.	Z.	Z.	Z.	(b).
Ship.		Engine.		Engine.	Engine.	Engine.	Ship.	Engine.	Ship.	Engine.	Engine.	—
Number.	Wage.	Number.	Wage.									
	s.		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
103	42	—	—	—	—	—	42	—	42	—	—	42
77	39 2	—	—	—	—	—	39	—	42	—	—	42
20	34	—	—	—	—	—	—	—	29/3	—	—	40/6
—	—	—	—	—	—	42	—	—	45	42	—	45
80	44 9	—	—	40	—	40	44/6	—	45	42	—	45 (c)
49	36 11	17	36 3	36	—	34	44/6	—	36	35 & 36	—	38
17	33	—	—	34	—	—	—	—	—	34 to 36	—	38
31	23/1 (a)	16	29/3	—	—	26	31/6	—	—	—	—	33
214	38	T. 330 P. 43	37 6 47 2	38	39	36	—	39	38	38	30 to 38	39
49	37	T. 235 P. 12	38 1 43	38	—	36	—	—	—	38	30 to 38	39
—	—	—	—	38	—	36	—	—	—	38	38	39
—	—	—	—	—	—	—	—	—	—	—	—	—
32	37 10	T. 68 P. 24	38 7 46 10	38	—	36	36	—	38	36 to 40	38 to 42	39
54	25/4	T. 86 P. 31	25 6 31 8	24	—	24	25/6	—	18	24 & 25 (d)	26 & 30	—
26	39/3	88 T. 127 P. 29	39 5 37 10 41 9	39	—	39	—	—	—	40 & 40/6	36 to 45	43 & 43/9
—	—	—	—	38	—	38	—	—	—	38	40	40
—	—	—	—	40	—	40	—	—	—	38	—	—
—	—	39	34 3	38	—	36	—	—	—	36 & 38	38	39
—	—	18	35 9	38	—	36	—	—	—	32 to 36	38	39
—	—	—	—	38	—	36	—	—	—	36 & 38	38	39
—	—	17	32 5	36	—	36	—	—	—	38	—	39
74	27/11	106	26 3	22 6	—	25	28/6	—	—	24 to 27	20 to 29/3	—
—	—	—	—	23	—	23	—	—	—	22 to 28 (c)	20 to 25	—
—	—	13	37 5	38	—	36	—	—	—	24 to 28	18 to 29/3	—
—	—	36	32 4	34	—	—	—	—	—	36 & 38	40	36
—	—	30	36 5	—	—	—	—	—	38	36 & 38	—	36
—	—	—	—	—	—	—	—	—	—	38	—	36 & 39
—	—	31	36 6	—	—	—	—	—	—	—	—	—
—	—	20	36 6	—	—	—	—	—	—	—	—	—
—	—	T. 32 P. 18	26 4 31 9	—	—	—	—	—	—	24 to 27	—	—
45	24 3	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	24 & 26	—	—	—
—	—	—	—	—	—	—	—	—	18 to 27	—	—	—
—	—	—	—	—	—	—	—	—	29/3	—	—	—
—	—	—	—	—	—	—	—	—	31/6 & 36	—	—	40/6
—	—	6	27 6	—	—	—	—	44/6	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	25	—	—	—	—	27	24 & 26	—	—
—	—	—	—	—	—	—	—	—	27	20 to 22	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	18	—	19	—	—	—	—	—	—
—	—	—	—	—	28 6	—	28/6	28/6	—	—	—	—
453	23 10	606	23 3	22	23	22	23	23	20	—	—	—
—	—	—	—	18	—	20	—	—	—	20 & 22	21	—
—	—	—	—	—	—	—	—	—	—	20 to 24	18 to 22	—

(d) 24s. to 26s. in boiler shops.

(c) Light platers in boiler shops, 40s. and 42s. in 1894, 42s. in 1901-05.

† Leon Levi, in the *Year-Book of Facts*, 1879.§ From the *Journal of the Statistical Society*, 1869.

LONDON.

In the case of London we are, unfortunately, unable to separate engineering from shipbuilding in all cases, as the information for earlier years fails to indicate which branch of the industry is meant. This is probably of little consequence, as where the same occupation is carried on both in shipyards and engine shops, the rates are almost invariably the same. This is so in the case of the iron shipbuilders, who have the same standard rates for shipbuilding and for boilermaking and for the engineers. A greater difficulty arises through the wide area which may be covered by the statements, and the effect of the inclusion or non-inclusion of any particular district in a return seriously affects the comparability of the rates given for various years. Fortunately we have good trade union accounts,³ some of them going nearly over the whole century, and with the well-ascertained stationariness of London wages, and especially their resistance to a reduction in the last half century, we are able to make a tolerably reliable index-number for many of the occupations. The following notes throw some further light on the course of London wages:—

In 1879 the (Engineering) Employers' Association gave notice of a reduction, as follows:—

	s.	s.		s.	d.
On wages from 24 to 28 inclusive	1	6			
„ 29 „ 32 „	2	—			
„ 33 „ 36 „	2	6			
„ 37 „ 42 „	3	—			

A strike took place where this reduction was attempted, and though some may have suffered it, it does not appear that wages were reduced to any large extent.

In May of 1882 the Amalgamated Society of Engineers raised their minimum to 38s.

In 1890 the shipjoiners struck successfully for a rise from 39s. to 42s.

In September, 1889, the patternmakers were raised from 39s. to 40s. 6d.

In 1887 an important rate was fixed, namely, for boiler and ship repairs, 48s. for platers and 42s. for rivetters.

³ See *Journal of the Royal Statistical Society*, March, 1905, p. 119, *et seq.*

An increase (apparently of 3*s.* a week) in boilermakers' and iron shipbuilders' rates took place between 1879 and 1892, and the date is not certain, but it seems indicated in the statement in the Boilermakers' report for February, 1892, that "in the past few years" advances of wages had been received, and that now the 8-hours day on repairs had been established without any change in wages. This remark might apply however to the case of the holders-up, who, in December, 1890, were increased to 33*s.* (apparently from 28*s.*), and, where three firms refused the 5*s.* rise, they struck.

In 1896 and 1897 the rates for rivetters rose from 36*s.* to 38*s.*, in 1897 the patternmakers were advanced 2*s.*, and in 1901 the engineers and patternmakers received an increase of 1*s.* per week or $\frac{1}{4}$ *d.* per hour (1*s.* 1 $\frac{1}{2}$ *d.*).

Brassey gives⁴ the following as the numbers employed in the principal shipbuilding yards on the Thames:—

1860	11,830	|	1869	20,880	|	1870	3,190
------------	--------	--	------------	--------	--	------------	-------

and speaks of a panic in shipbuilding in the year 1870. He also speaks of a "defeat of the shipwrights on the Thames in 1852."

The following notes are from the evidence to the Royal Commission on Trade Unions, 1867:—

An employer stated that—

Iron ships dated from 1840 on the Thames. In 1825 there was a shipwrights' strike for a rate book, which was still in existence. There had been no rise since. In his yard they did not employ boilermakers, the shipwrights doing iron work. "Job work" was the custom of the trade. When shipwrights did rivetting they got 7*s.* or 7*s.* 6*d.* a day, whereas the regular class of rivetters got 4*s.* 6*d.*

Another employer stated that—

In thirty-five years wages had risen 25 to 30 per cent., and 15 per cent. of that in the past seven or eight years.

In 1866 painters rose from 30*s.* to 33*s.*, and the fitters from 35*s.* to 38*s.*

Previous to 1854 joiners got 5*s.* 6*d.*, but they then obtained 6*s.* The shipwrights, till 1862, had 6*s.* 6*d.* or 7*s.*, the greater number being at 6*s.* 6*d.* This went back to 1851. After 1862 7*s.* became the minimum. Since 1866, *i.e.*, till 1868, they had been rather sinking.

⁴ *Work and Wages*, 1869, p. 241.

In his works, in 1837, none were at 40s.; in 1865, 14 or 15 per cent. were above 40s. In 1832-35 the average of all was 23s. or 24s.; in 1865, 31s.

From 1851 to 1866 or 1867 the rise on whole was 30 per cent.

A third employer, at Millwall, said that—

Labourers averaged 22s. 7*d.*, ranging from 18s. to 27s.; drillers got 27s., and boilermakers' platers 6s. a day.

1865 was best year of the past six. About two-thirds of the establishment had 36s. as minimum. His own money twenty-five years ago was 36s., and he would now get 38s. or 39s. as a leading man. Had just reduced shipbuilders 10 per cent. under the wages of 1865.

There had not been in engineering a rise of 30 per cent. Wages had not been raised to any extent for twenty years, and "in our establishment" the rate was about the same as thirty years ago.

The Secretary of the Thames Shipbuilding Company stated that—

His firm employed boilermakers for shipbuilding. Eleven years ago the shipwrights had 6s. 6*d.*; highest since then 8s.; 7s. a day was the "present wage."

The shipwrights had been at 6s. 6*d.* or 7s. for forty years; believed minimum recognised by shipwrights to be 7s., which had stood for some years; "now" many are taking 6s. 6*d.* They had 6s. 6*d.* before Russian war. The joiners had 6s. in 1866.

The President of the Provident Shipwrights' Union said that—

London was the only port where they worked "job" or piece work. In 1825, after a strike, the minimum was settled at 6s. The rate was "now" 7s., but 6s. was still the minimum.

Another witness said that—

Shipwrights, before 1824, had 5s.; in 1825 to the Crimean war, 6s.; during the war, 7s., 8s., 14s., 15s.; and in one instance, 20s. or 21s. a day was paid. At the close of the war they fell to 6s. 6*d.*; in 1866 rose to 7s., which still prevails.

(This account, however, seems to apply really to the barge-builders.)

From these accounts it is seen that the prevalence of job work, with its artificial minimum rate of pay per day, which meant really an advance on account, makes it very doubtful what were the real rates for shipwrights. The 7*s.* minimum, however, obtains to-day. The Associated Shipwrights, who do not recognise job work, have 7*s.* as their minimum daily wage.

W. Allen, Secretary of the Amalgamated Society of Engineers, said that—

In London, in the last thirty years, engineers had risen 10 per cent. (apparently from 34*s.* to 36*s.*, being the change in the standard rate). In another portion of his evidence he said that during the past twelve years wages had fluctuated little or nothing in London or Manchester, but within the “past twelve months” (March, 1866, to March, 1867) there had been an upward tendency. From 1840 to 1852 London wages had been as constant and regular as from 1852 to 1866. Engineers’ wages in London at the date of this evidence were 36*s.*

A representative of the Boilermakers said that—

In 1841 rivetters had 28*s.*, in 1868 30*s.*

D. Guile, Secretary of the Friendly Ironfounders, said that—

Wages were 38*s.* “now,” having risen from 36*s.* in September, 1866. In one shop the wages were from 38*s.* to 50*s.*

TABLE 2.—GLASGOW AND THE CLYDE. *Wages for an Ordinary Week's*

(Gl. = Glasgow. Gr. = Greenock.)

Year	—	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1863.	1863.	1866.	1870-71.
Reference	—	B.	B.	B.	A.	A.	A.	A.	A.	A.	B.	A.	I a.
Place	—	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.
	Time or Piece Work.												
Patternmakers.....	T.	—	—	—	23	23	23	23	25	—	—	23	28
Ironmoulders	T.	—	—	—	27	27	27	26	25 6	—	—	29	29
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Dressers.....	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Grinders	T.	—	—	—	—	—	—	—	—	—	—	—	31
Ironmoulders' labourers	T.	—	—	—	14	11	14	14	—	—	—	—	—
Fitters	T.	25	24	24	21 6	22	21, 23	22, 22 6	25	25	23	23	25
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Finishers	T.	—	—	—	—	—	—	—	—	—	—	—	25
Millwrights	T.	25	24	24	21	22 6	23	23 6	—	—	—	—	—
Turners	T.	27	26	25	23	24 6	23, 24	23, 24	25	24	23	23	25
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Planers	T.	—	—	—	—	—	—	—	—	—	—	—	25
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Slotters	T.	—	—	—	—	—	—	—	—	—	—	—	25
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Screwers	T.	—	—	—	—	—	—	—	—	—	—	—	—
Borers	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Drillers	T.	—	—	—	—	—	—	—	—	—	—	—	16
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Machinemn.....	T.	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	T.	26	26	25	21 6	24	24	24, 25	25	—	—	24	26
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Strikers	T.	—	—	—	—	—	—	—	—	—	—	18	17
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Whitesmiths	T.	—	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders	T.	—	—	—	—	—	—	—	—	—	—	—	29
Brassfinishers	T.	—	—	—	—	—	—	—	25, 30	—	—	—	—
Coppersmiths	T.	—	—	—	—	—	—	—	20, 24	—	—	—	28
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Joiners	T.	—	—	—	—	—	—	—	21	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Labourers.....	T.	15	14	14	13	13	13 6, 14	13, 11	15	14	15	15	15
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Boiler shops—													
Boilermakers	T.	21, 24	21, 25	20, 21	21	21 6	22, 27	22 9, 27	25 6	—	—	25	26
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Platers	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Riveters	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Caulkers	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Holders up	T.	—	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	T.	—	—	—	—	—	—	—	—	—	—	—	—
Smiths' strikers	P.	—	—	—	—	—	—	—	—	—	—	—	—

I a. Locomotive works.

I b. Marine.

Work in Engineering, Boilermaking, and Ironfounding. 1856—1903.

N. = The Clyde.)

1870-71.	1872.	1872.	1873.	1874.		1874.	1875.	1876.	1877.	1878.	1879.	1880.	1880.	1880.	
I b.	I c.	O.	O.	I d.		O.	O.	O.	O.	O.	O.	O.	A.	B.	
Gl.	Gl.	Gr.	Gr.	Gl.		Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gr.	Gl.	Gl.	
				Number.	Wage.									Number.	Wage.
<i>s.</i> 26 6	<i>s.</i> 27 4	<i>s.</i> 26 9	<i>s.</i> 26 6½	68	<i>s.</i> 32	<i>s.</i> 29 9	<i>s.</i> 29 9	<i>s.</i> 28 8½	<i>s.</i> 26 6½	<i>s.</i> 27 7½	<i>s.</i> 25 9	<i>s.</i> 27	<i>s.</i> 30 31 6	<i>s.</i> 6 5	<i>s.</i> 31 6
—	—	—	—	5	22 4	—	—	—	—	—	—	—	26	—	—
—	—	—	—	9	18	—	—	—	—	—	—	—	23	—	—
21 3	26	26 2½	28 2½	222	28 5	28 8½	29 9	27 7½	27 1½	27 1½	26 10½	27	26, 35	10 6	29 9
24 3	25 3	26 2½	28 2½	—	—	28 8½	29 9	27 7½	27 1½	27 1½	26 10½	27	—	7 5	27 6
25	26 6	28 11½	28 8½	4	32 8	—	—	—	—	—	—	—	—	—	—
—	—	—	—	49	30 2	29 9	29 9	28 8½	28 2½	27 7½	26 10½	28 1½	30	13 2	30 6
—	25 1	—	—	—	—	—	—	—	—	—	—	—	21	4 5	28
—	—	—	—	—	—	—	—	—	—	—	—	—	—	*	—
—	—	—	—	—	—	—	—	—	—	—	—	—	17	—	—
—	19 7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	5 7	24
22 9	—	—	—	{ 16 22 22	31 27 9 22 3	—	—	—	—	—	—	—	—	0 9	24 9
27	27 5	27 10½	28 8½	33	30	30 9½	29 9	28 8½	28 8½	28 8½	28	29 3	24	3 7	30 6
16	18 9	—	—	41	18 10	—	—	—	—	—	—	—	14 9	5 3	21
—	—	—	—	13	27 6	—	—	—	—	—	—	—	24 6	—	—
—	—	—	—	7	36 1	—	—	—	—	—	—	—	32	—	—
—	—	26 2½	27 7½	12	28	28 2½	28 2½	27 1½	27 1½	27 1½	28	27	—	—	—
27 3	26 6	—	—	5	34	—	—	—	—	—	—	—	—	—	—
—	—	—	—	68	32	—	—	—	—	—	—	—	26	2 2	29 3
14 3	—	—	—	{ 126 193	16 ½ 17 ½	—	—	—	—	—	—	—	16 6	23 9	17
26 9	—	—	—	31	33	—	—	—	—	—	—	—	—	8 0	30 6
26 9	32	31 9½	33 5½	119	29 8	35 0½	35 0½	32 1½	30 9½	30 9½	30 3	32 7½	—	—	—
22 6	28 9	27 10½	29 9	—	—	31 4½	29 9	26 6½	27 1½	28 8½	26 10½	28 1½	—	—	—
22 6	28 9	27 10½	29 9	{ 51	29 {	31 4½	29 9	26 6½	27 1½	28 8½	26 10½	28 1½	—	—	—
14 3	—	—	—	16	20 1	—	—	—	—	—	—	—	—	1 9	20 3
26	—	—	—	19	27	—	—	—	—	—	—	—	—	—	—
15 6	—	—	—	21	19	—	—	—	—	—	—	—	—	—	—

I c, I d. One large works only, and apparently the same works in each year.

* With planers.

TABLE 2—GLASGOW AND THE CLYDE. *Wages for an Ordinary Week's*

(Gl. = Glasgow. Gr. = Greenock.)

Year	—	1880.	1881.	1882.	1883.	1883.	1883.	1884.	1884.	1885.	1886.	1886.
Reference	—	B.	O.	O.	B.	B.	O.	K.	O.	O.	O.	L.
Place	—	Gr.	Gr.	Gr.	Gl.	Gr.	Gr.	Gl.	Gr.	Gr.	Gr.	Cl.
	Time or Piece Work.	s.	s.	s.	Num- ber.	Wage.	s.	s.	s.	s.	s.	s.
Patternmakers.....	T.	30 6	31 6	31 6	2	31, 35	34 2	33 2½	29 3	32 7½	31 6	27
Ironmoulders	T.	33 6	—	—	6	32, 35	33, 10	—	33 9	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Dressers.....	T.	23 6	—	—	2	22 6	25	24	29 3	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Grinders.....	T.	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders' la- bourers	T.	—	—	—	—	—	—	—	—	—	—	—
Fitters	T.	29	30 4½	30 4½	11½	30 9	30 6 33 6	32 7½	—	31 6	29 3	28 1½
	P.	—	—	—	—	35	—	—	—	31 6	29 3	28 1½
Finishers	T.	28 9	30 4½	30 4½	—	—	33	32 7½	—	31 6	29 3	28 1½
Millwrights	T.	—	—	—	—	—	—	—	27	—	—	—
Turners	T.	29	30 4½	31 6	6	31 3	33 3	32 7½	—	32 7½	30 4½	29 3
	P.	—	—	—	—	33 6	—	—	—	—	—	—
Planers	T.	28	—	—	2	28, 32	30, 33 6	—	—	—	—	—
	P.	—	—	—	—	33, 36 6	—	—	—	—	—	—
Slotters	T.	§	—	—	—	§	§	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Screwers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Borers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Drillers	T.	24	—	—	3	22 3	—	—	—	—	—	21
	P.	—	—	—	—	26	—	—	—	—	—	—
Machinemen.....	T.	25	—	—	—	—	21 6	—	—	—	—	—
Smiths	T.	29 3	30 4½	30 4½	4	29 8	32, 34	33 9	29 3 30 4½	32 7½	31 6	30 4½
	P.	—	—	—	—	34, 40	—	—	—	—	—	—
Strikers	T.	18 7	—	—	5	20 4	19	—	20 3	—	—	18
	P.	—	—	—	—	21 23	—	—	—	—	—	—
Whitesmiths	T.	—	—	—	—	—	—	—	29 3	—	—	30
Brasmoulders	T.	—	—	—	½	34 6	33 6	—	29 3	—	—	—
Brassfinishers	T.	30	29 9½	29 9½	—	—	31 8	31 6	31 6	29 3	27	26 5½
Coppersmiths	T.	—	—	—	—	—	—	—	—	—	—	30
Joiners	T.	27, 32 6	—	—	2	29, 32	30 9	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Labourers.....	T.	17	—	—	28	17, 19	18	—	—	—	—	15
	P.	—	—	—	—	—	—	—	—	—	—	—
Boiler shops—												
Boilermakers	T.	31	—	—	6	34	—	—	—	—	—	29
	P.	—	—	—	—	—	—	—	—	—	—	—
Platers	T.	—	33 9	33 9	—	—	35 6	37 8½	—	34 10½	32 7½	31 6
	P.	—	—	—	—	—	—	—	—	—	—	—
Rivetters	T.	—	29 9½	30 11½	—	—	33 6	34 10½	—	32 7½	30 4½	28 1½
	P.	—	—	—	—	—	—	—	—	—	—	—
Caulkers	T.	—	29 9½	30 11½	—	—	—	34 10½	—	32 7½	30 4½	28 1½
	P.	—	—	—	—	—	—	—	—	—	—	—
Holders-up	T.	20 6	—	—	1	20, 22	21 3	—	—	—	—	20
	P.	—	—	—	—	—	—	—	—	—	—	—
Smiths	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Smiths' strikers	P.	—	—	—	—	—	—	—	—	—	—	—

* Angle-smiths.

§ With planers.

Work in Engineering, Boilermaking, and Ironfounding. 1856—1903—Contd.

Cl. = The Clyde.)

1886.		1886.	1888.	1890.	1893.	1903.	'93-94	1896.†	1896 ‡	1897.	1898.	'99-02.	1903-04.
F.		Z.	Z.	L.	ll.	R.	Z.	Z.	Z.	Y. and Z.	Y. and Z.	Y. and Z.	Y. and Z.
Gl.		Gl.	Gl.	Cl.	Cl.	Cl.	Gl.	Gl.	Gl.	Cl.	Cl.	Cl.	Cl.
Num- ber.	Wage.												
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
204	29 10	30/4	34 10	38/3	34/10½	{ 37 1½ 38 3 }	34 10½	34 10½	37 1½	38 3	39 4½	39 4½	38/3
432	30 4	—	—	34 4	—	—	—	—	—	—	—	—	—
54	35 10	—	—	—	—	—	—	—	—	—	—	—	—
152	22 10	—	—	24/9	—	—	—	—	—	27, 28 1½	28 1½, 29/3	—	—
30	23 6	—	—	—	—	—	—	—	—	—	—	—	—
25	30 8	—	33	—	—	—	—	—	—	—	—	—	—
—	—	15/9	—	—	—	—	—	—	—	—	—	—	—
731	27 6	27	28	34/11	30 4½	34/10½	30 4½	30 4½	33 9	34 10½	36	36	34/10½
257	33 10	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	30 4½	—	30 4½	31 6	33 9	34 10½	36	36	34/10½
30	28 10	24/3	28	—	30 4½	—	30 4½	—	—	—	—	—	—
84	28 6	29/3	29	—	32 7½	34 10½	32 7½	31 6	33 9	34 10½	36	36	34 10½
115	33 5	—	—	—	—	—	—	—	—	—	—	—	—
65	25 11	29/3	—	—	33 2½	—	33 2½	31 6	33 9	34 10½	36	36	34 10½
43	32 6	—	—	—	—	—	—	—	—	—	—	—	—
24	25 8	29/3	28	—	32 7½	—	32 7½	32 7½	34 10½	36	37 1½	37 1½	36
25	29 9	—	—	—	—	—	—	—	—	—	—	—	—
24	20 4	—	—	—	23 6½	—	23 6½	—	—	—	—	—	—
101	20 7	—	—	—	28 1½	—	28 1½	29 3	32 7½	33 9	34 10½	34 10½	33 9
50	25	—	—	—	—	—	—	—	—	—	—	—	—
241	20	{ 17, 21/6 }	24/9	—	—	—	—	—	—	—	(+ 1/6)	—	—
54	26 2	—	—	—	—	—	—	—	—	—	—	—	—
149	26 1	—	—	—	—	—	—	—	—	—	—	—	—
212	28 9	30/4	30	36	—	{ 34 10½ 37 1½ }	—	36	37 1½	38/3	39 4½	39 4½	38/3
159	35 10	—	—	—	—	—	—	—	—	—	—	—	—
281	18 6	18	19	22 6	—	—	—	—	—	(+ 2 1/2)	—	—	—
261	23 4	—	—	—	—	—	—	—	—	—	—	—	—
30	28 7	—	—	33 9	—	{ 37 1½ 40 6 }	—	33 9	36	37 1½	38/3	38 3	37 1½
26	30 2	29/3	30 4	—	—	36, 37 1½	—	33 9	36	37 1½	38 3	38 3	37 1½
51	27 11	29/3	29 3	—	31 6	34 10½	—	31 6	31	33 3	34 4½	35 6	34 4½
29	31 2	—	—	33 9	—	—	—	—	—	36	37 1½	38/3	37 1½
112	29 10	—	—	—	—	—	—	—	—	—	—	—	(- 1 1½)
18	35 9	—	—	—	—	—	—	—	—	—	—	—	—
2,559	17	15 9	16	19 8	16 10½	18	16 10½	—	—	—	—	—	—
174	22 11	—	—	—	—	—	—	—	—	—	—	—	—
—	—	29/3*	32*	34/4	—	41 7½*	—	36, 40* 38, 42*	38, 42*	40, 44*	40, 44*	40, 44*	39, 43*
102	31 6	30 4	33	—	38 3	{ 41 7½ 38 3 }	38 3	36	38	38	40	40	39
80	42 2	—	—	—	—	—	—	—	—	—	—	—	—
219	28	27	32	37 8	33	36	33	34 3	36 3	36 3	38 3	39 3	36 9, 37 3
57	40 2	—	—	21 11½	—	—	—	—	—	—	—	—	—
36	28 5	27	32	—	33	36	—	33	35	35	37	37	35 6, 36
72	19 5	—	—	25 11	21 1½	—	21 4½	24 9	26 9	26 9	28 9	28 9	27 9
29	23 10	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	35 5½	36	35 5½	—	—	—	—	—	—
—	—	18	18 6	—	20 9½	{ 18 to 22 6 }	20 9½	—	—	—	—	—	—

† January 1st.

‡ November.

These rates are standard rates, not "majority" rates, as also apparently are those stated for 1893-94.

TABLE 3.—GLASGOW AND THE CLYDE. *Wages for an*

(Gl. = Glasgow. Gr. = Greenock.

Year	—	1856.	1857.	1858.	1859.	1860.	1861.	1863.	1866.	1866.	1869.	1871.
Authority ...	—	D. E.	D. E.	D. E.	D. E.	D. E.	D. E.	D. E.	D.	E.	££	L.
Place	—	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Gl.	Cl.	Cl.
									Num- ber.	Wage.		
		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Angle-iron smiths {	T.	—	—	—	—	—	—	—	—	—	24, 29	—
	P.	—	—	—	—	—	—	—	—	—	—	26
Angle-iron smiths' {	T.	—	—	—	—	—	—	—	—	—	—	—
strikers	P.	—	—	—	—	—	—	—	—	—	—	—
Platers	T.	22, 27	22, 27	23, 24	23	23	26, 27	27	3.57	28.9	28, 30	28
	P.	—	—	—	—	—	—	—	—	—	—	24, 29
Rivetters	T.	21, 22	20, 22	18	17	17	21, 23	23, 26	10.01	25.10	26	22
	P.	—	—	—	—	—	—	—	—	—	—	21, 22
Caulkers	T.	21, 22	20, 22	18	17	17	22, 23	23, 26	5.81	25.9	—	22
	P.	—	—	—	—	—	—	—	—	—	—	22
Holders-up	T.	—	—	—	—	—	—	—	—	—	16	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Drillers and hole- {	T.	—	—	—	—	—	—	—	2.24	12.10	—	16, 3
cutter's	P.	—	—	—	—	—	—	—	—	—	—	—
Shipsmiths	T.	22, 6, 26	24, 27	{ 21, 6 24 }	22	24, 6	23, 28	25	5.06	28.8	20, 32	—
	P.	—	—	—	—	—	—	—	—	—	—	25
Shipsmiths' strikers {	T.	15	15	15	14	15	14, 15	16	4.66	16.6	14, 18	—
	P.	—	—	—	—	—	—	—	—	—	—	15, 6
Shipwrights	T.	30	30	24	24	24	24, 27	30	7.71	30.7	30	27
	P.	—	—	—	—	—	—	—	—	—	—	27
Joiners	T.	24, 25	24, 27	23, 24	22, 6	23	23	25	13.34	28.1	24, 29	27
	P.	—	—	—	—	—	—	—	—	—	—	27
Sailmakers	T.	—	—	—	—	—	—	24	—	24	—	25
	P.	—	—	—	—	—	—	—	—	—	—	—
Sawyers	T.	30	24	24	24	24	—	27	0.63	25.10	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Sawmillers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Helpers	T.	12, 13	12, 13	12, 13	13	13	13, 14	13, 14	31.36	14.2	—	14
	P.	—	—	—	—	—	—	—	—	—	—	—
Labourers	T.	—	—	—	—	—	—	—	—	—	12, 16	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Engineers	T.	—	—	—	—	—	—	—	1.79	26.9	—	26
	P.	—	—	—	—	—	—	—	—	—	—	24, 29
Fitters	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Turners	T.	—	—	—	—	—	—	—	—	—	—	32
	P.	—	—	—	—	—	—	—	—	—	—	29
Patternmakers	T.	—	—	—	—	—	—	—	—	28.1	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Brassfinishers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Coppersmiths	T.	—	—	—	—	—	—	—	—	—	—	23, 6
	P.	—	—	—	—	—	—	—	—	—	—	—
Machinemen	T.	—	—	—	—	—	—	—	1.67	15.10	—	30
	P.	—	—	—	—	—	—	—	—	—	—	30, 3
Painters	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Plumbers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Riggers	T.	21, 27	27	27	27	27	21, 27	24, 27	2.37	25.9	—	26
	P.	—	—	—	—	—	—	—	—	—	—	24
Blockmakers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Cabinetmakers	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Boatbuilders	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—
Red-leaders	T.	—	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—

D. E. The figures were apparently originally in one table, but were split up when the "Returns" were being compiled. Riggers are given under miscellaneous trades at the end of the volume.

* This rate is given for 1875, 1876, and 1877. They fell in 1875 from 27s. 7½d., and in 1874 from 28s. 8½d.

† 28s. 8½d. in 1874.

Ordinary Week's Work in Shipbuilding. 1856-1904.

Cl. = The Clyde.)

1872.	1872.	1873.	1874.		1874.	1875.	1876.	1877.	1877.	1878.	1878.	1879.	1880.	1880.	
I.	O.	O.	I.		O.	O.	O.	O.	Q.	J.	O.	O.	O.	D.	
Gl.	Gr.	Gr.	Gl.		Gr.	Gr.	Gr.	Gr.	Gl.	Gl.	Gr.	Gr.	Gr.	Gl.	
			Num- ber.	Wage.										Num- ber.	Wage.
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
—	—	—	14	27 6	—	—	—	—	—	—	—	—	—	0 5	24 9
—	—	—	13	17	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	33 3	—	—	—	6 3	30 6
26 6	114**	109	146	27 6	94	93	87	98	24 5½	26 8	81	94	92	14 6	25 6
26 6	106**	101	68	27 6	94	87	80	87	24 5½	26 8	77	76	84	—	40
26 6	123**	117	75	17	87	87	76	80	—	—	80	89	81	4 8	29 3
16 2	—	—	88	19 6	—	—	—	—	—	—	—	—	—	—	41 9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	2 2	16 9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	6 3	20 9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	2 8	30
25 8	20 3	20 9	78	27 6	29 9	28 2	27 7½	27 1	26 6¾*	26 8	27 1	27	27	5 1	25 9
—	—	—	100	18	—	—	—	—	—	18 2	—	—	—	4 2	18
28 8	30 4½	31 10½	256	33	34	31 10½	29 9	29 9	29 9	31	29 9	29 3	29 3	11 6	31 6
26 6	29 3	30 9½	266	33	31 10½	30 9½	29 9	29 9	26 6¾§	33 3	29 2½	29 3	28 1½	7 7	29
—	—	—	—	—	—	—	—	—	—	29	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	24 6	—	—	—	0 6	25 9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	226	17	—	—	—	—	—	17 10	—	—	—	—	16 9
—	—	—	227	17	—	—	—	—	—	17 10	—	—	—	14 3	20
—	—	—	—	—	—	—	—	—	—	—	—	—	—	11 9	16 6
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	31	—	—	—	2 7	23 9
—	—	—	10	27 6	—	—	—	—	26 6¾†	26 8	—	—	—	—	—
—	—	—	43	29 6	—	—	—	—	—	26 8	—	—	—	—	—
—	—	—	7	33	—	—	—	—	—	33 3	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	31	—	—	—	—	—
—	—	—	15	29 6	—	—	—	—	—	29	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	31	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	26 8	—	—	—	—	—
22	29 3	31 4	59	32	31 4	31 4	31 4	31 4	30 9¼	33 3	31 4	30 11	31 6	1 7	20 6
—	—	—	25	32	—	—	—	—	29 9	—	—	—	—	—	—
—	—	—	45	28 8	—	—	—	—	27 7½	26 8	—	—	—	0 6	24 3
—	—	—	8	29 7	—	—	—	—	—	—	—	—	—	—	—
—	—	—	18	34	—	—	—	—	—	—	—	—	—	—	—
—	—	—	25	31	—	—	—	—	—	—	—	—	—	—	—
—	—	—	45	19 3	—	—	—	—	—	—	—	—	—	—	—

§ 28s. 8½d. in 1873, 30s. 9½d. in 1874, 32s. 11½d. in 1875, and 30s. 9½d. in 1876.

** The numbers printed thus 114 are index numbers. For explanation, see p. 580.

§§ From the *Journal of the Statistical Society*, 1869.

† From p. 206 of "Returns."

TABLE 3—GLASGOW AND THE CLYDE. *Wages for an*

(Gl. = Glasgow. Gr. = Greenock)

Year	—	1883.	1880.	1883.	'81-83.	1884.	1884.	1881.	1882.	1883.	1884.
Authority ...	—	D.	D.	D.	K (a).	K (b).	K (c).	O.	O.	O.	O.
Place	—	Gl.	Gr.	Gr.	Cl.	Cl.	Cl.	Gr.	Gr.	Gr.	Gr.
		Num- ber.	Wage.		Num- ber.	Wage.					
		s.	s.		s.	s.	s.	s.	s.	s.	s.
Angle-iron smiths {	T.	1	32	28	—	—	—	—	—	—	—
	P.	—	46, 60	33	1·0	67, 80	—	—	—	—	—
Angle iron smiths' strikers {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Platers {	T.	4	32, 36	27	5·5	—	—	—	—	—	—
	P.	—	63, 70	33	—	70, 80	—	—	—	—	—
Rivetters {	T.	6	30·6	23·6	9·5	—	—	33·9	—	—	—
	P.	—	40, 60	31	—	60·6	—	—	100†	109	112
Caulkers {	T.	6	30	23·4	4·0	25·6	—	—	33·9	—	—
	P.	—	40, 50	31	—	33, 50	—	—	100†	142	124
Holder-up {	T.	5	18·6	17·4	8·0	15·1	—	—	—	—	—
	P.	—	33, 36	22·6	—	32, 38	—	—	—	—	—
Drillers and hole-cutters {	T.	4	19·6	—	—	—	—	—	—	—	—
	P.	—	30·6 32·6	24	3·0	32, 42	—	—	—	—	—
Shipsmiths {	T.	2	31·6	28	2·5	30·6 { 33·9 36 }	30/4½	29/3	29·3	31·6	31·6
	P.	—	40, 57	33·6	—	50·6	—	—	—	—	—
Shipsmiths' strikers {	T.	4	18	17·6	5·0	18	27	19 1½	18	—	—
	P.	—	28, 30	24·6	—	22·3	—	—	—	—	—
Shipwrights {	T.	8	35	30	5·8 { 32·3 36 }	36	31·6	31·6	31·6	33·9	36
	P.	—	—	—	—	31·6 33·9	29/3	29·3	30/4½	30/4½	33·9
Joiners {	T.	12	32·6	28·3	9·5	32·6	31·6	29/3	29·3	30/4½	30/4½
	P.	—	—	—	—	—	—	—	—	—	—
Sailmakers {	T.	—	—	27	—	30	—	—	27	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Sawyers {	T.	—	—	28·6	0·3	31	—	—	24·9	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Sawmillers {	T.	1	30·3	22	0·3	24 10	—	—	—	—	—
	P.	—	16, 18	16·9	—	15	—	—	—	—	—
Helpers {	T.	12	30, 35	21·6	14·5 { 26·6 29·3 }	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Labourers {	T.	9 { 16·6 18·6 }	16·6	10·5	16·6	20	16	19 1½	—	—	—
	P.	—	21·6	—	—	—	—	—	—	—	—
Engineers {	T.	—	—	26	1·0	31·6 { 31·6 34 10½ }	29/3	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Fitters {	T.	2 { T33,36 P42,67 }	27	—	—	—	—	31·6	—	—	—
	P.	—	33	—	—	—	—	—	—	—	—
Turners {	T.	—	—	—	—	—	—	27	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Patternmakers {	T.	—	—	—	—	—	—	31·6	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Brass-moulders {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Brassinishers {	T.	—	—	—	—	—	—	29·3	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Coppersmiths {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Machinemen {	T.	—	—	—	—	33·9	27	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Painters {	T.	3	32	30	2·2	29·2	36	31·6	28 1½	31·6	31·6
	P.	—	—	—	—	—	38 1½	36	31·6	—	—
Plumbers {	T.	—	—	—	—	30·6	33·9	28·2	27	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Riggers {	T.	1	30·6	—	0·1	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Blockmakers {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Cabinetmakers {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Boatbuilders {	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Red-leaders {	T.	—	—	—	—	—	—	21 4½	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—

K (a). During the recent busy times.

K (b). Early in 1884.

K (c). Apparently later in 1884.

GLASGOW AND THE CLYDE.

With regard to the Clyde, there is some evidence of an important nature which cannot very easily be placed in the general tables. Edward Young says that the increase by October, 1872, averaged about 15 per cent. in shipbuilding. He apparently is speaking of the increase after the depression of 1868-69. In the report of the United States Consul for 1884, in which the rates for 1881-83 and 1884 in Table 3 K. (*a*) (*b*) and (*c*) were given, he states that the years 1878 and 1879 were years of depression, that the revival began in 1880, and that 1881-83 were characterised by the greatest amount of activity that has ever been experienced in the history of the industry. At the beginning of 1884 the depression set in.

Mr. J. Scott, of Greenock, in his evidence to the Royal Commission on Trade Depression, handed in a table showing the actual prices paid for similar kinds of work done by platers, rivetters, and caulkers from 1872 to 1885. As these cannot be fitted on to any other record, no useful purpose would be served by reprinting them, but index-numbers have been constructed from them (with 1881 as the base year) which show something of the course of piece-work earnings over this period, and these numbers are reprinted in Table 3, thus *114*. He also stated that at that date, April, 1886, shipbuilders' wages were 40 per cent. below 1882-83, and 10 per cent. below 1879. The advance between 1879 and 1882-83 was from 40 to 50 per cent. The unskilled labourers did not fluctuate much, being almost stationary. There had been a slight fall since 1882-83, but not much. The engineers got advances equaling 15 per cent. during the sprint of 1882.

At the Clyde Shipwrights' Arbitration in 1877, besides the rates given for that year in Table 3 Q., it was stated that between 1871 and 1874 the rise of wages averaged 31 per cent., and, if the reduction in hours from 57 to 51 was allowed for, this was increased to 42½ per cent.

In 1903 the Glasgow Municipal Commission on the Housing of the Poor took some evidence with regard to wages at Glasgow. Three witnesses gave evidence relating to engineering and shipbuilding. One of these, comparing 1870 and 1902, said that returns from a large foundry showed an increase of 29½ per cent. for moulders, fitters, and patternmakers, and from a large shipyard they showed an average advance of 41 per cent. (The witness did not state to exactly what classes this increase referred.) In one engine shop it was found that engineers had advanced 36 per cent. and labourers 22½ per cent., and in two others the advances were :—

	A.	B.		A.	B.
	Per cent.	Per cent.		Per cent.	Per cent.
Erectors	19 $\frac{1}{2}$	—	Boilermakers	19 $\frac{1}{3}$	—
Fitters	14 $\frac{1}{2}$	14 $\frac{1}{2}$	Smiths	7	11
Turners	20	—	Strikers	11 $\frac{3}{4}$	14
Machinists	20	—	Labourers	—	17

A witness from the Trades Council said that labourers' wages in foundries in 1903 ranged from 17s. to 19s., and in engineering and shipbuilding from 15s. 9d. to 20s., averaging 18s. in each case. The same witness also gave the wages of engineers as 27s. in 1886 and 36s. in 1903 (before the reduction of 1s. in that year), and of tinplate and sheet metal workers as 28s. for 51 hours in 1873, and 34s. for 51 hours in 1903.

By far the most important evidence, however, was given by Mr. Alex. McGregor Smith, representing the Engineering and Shipbuilding Employers' Associations. A portion of this evidence is tabulated in Tables 2 and 3 R. The rates for labourers were given in the detailed form contained in the following table, the median being added:—

*Numbers of Labourers, &c., Employed at certain Rates per Hour
(Fifty-four Hours per Week).*

Hourly Rate.	Labourers in			Time Hammermen in	Platers' Helpers in
	Ship Yards.	Engine Shops.	Boiler Shops	Ship Yards	Boiler Shops.
Below 3 $\frac{1}{2}$ d.	59	—	23	—	} 42
At 3 $\frac{1}{2}$ d.	42	74	87	—	
„ 3 $\frac{3}{4}$ d.	600	241	122	7	
„ 4d.	763	463	477	25	84
„ 4 $\frac{1}{4}$ d.	335	341	76	16	35
„ 4 $\frac{1}{2}$ d.	564	328	74	99	93
„ 4 $\frac{3}{4}$ d.	121	79	27	211	51
„ 5d.	179	140	—	74	34
„ 5 $\frac{1}{4}$ d.	160	—	—	—	17
„ 5 $\frac{1}{2}$ d.	—	—	—	—	16
From 5d. to 6d. ...	—	—	23	—	—
„ 5 $\frac{3}{4}$ d. „ 6 $\frac{1}{4}$ d.	—	94	—	—	—
„ 5 $\frac{1}{2}$ d. „ 6 $\frac{1}{2}$ d.	—	—	—	—	6
„ 5 $\frac{3}{4}$ d. „ 7d.	—	—	—	4	—
Total	2,823	1,760	909	436	378
Median	4 $\frac{1}{4}$ d.	4 $\frac{1}{4}$ d.	4d.	4 $\frac{3}{4}$ d.	4 $\frac{1}{2}$ d.

The numbers of time hammermen in boiler shops at the various rates were not stated separately, but there were 52 with wages ranging from 3d. to 5 $\frac{1}{4}$ d. per hour, and of these 36 per cent. were

under $4\frac{3}{4}d.$ per hour, 42 per cent. were at $4\frac{3}{4}d.$, and 22 per cent. were above that rate.

As the labourers are not organised, there have been no general changes in their rates, and their wages do not fluctuate with the others. There may have been some changes in recent years, as the average now is considerably above that recorded in the Wage Census of 1886. In the case of other workers, the changes have been since 1890 (apparently since January, 1890, but this is not stated):—

	Advances.		Reductions.	
	Number.	Amount.	Number.	Amount.
Shipyards—				
Ironworkers, <i>i.e.</i> , iron shipbuilders	5	Per cent. 20	4	Per cent. 20
		Per hour. <i>d.</i>		Per hour. <i>d.</i>
Time				
Piece				
Shipwrights	5	$1\frac{1}{4}$	3	$\frac{3}{4}$
Joiners	4	1	3	$\frac{5}{4}$
Blacksmiths	5	$1\frac{1}{4}$	2	$\frac{1}{2}$
Blacksmiths	5	$1\frac{1}{2}$	3	$\frac{3}{4}$
Engine and boiler shops—				
Blacksmiths	4	$1\frac{1}{4}$	2	$\frac{1}{2}$
Boilermakers	5	$1\frac{1}{4}$	2	$\frac{1}{2}$
Engineers	5	$1\frac{1}{2}$	2	$\frac{1}{2}$

The engineers have also had a further equalising advance of $\frac{1}{4}d.$ per hour.

Since the date of this evidence (June, 1903) no changes have taken place in the wages of these classes.

In 1898, when advances were being given to practically all skilled workers on the Clyde, the Labour Department reported that no general advance was granted to labourers, and very little change appeared to have been made. A return received by the Department showed that at the end of 1898, 29 per cent. of the shipyard labourers in the Clyde district were receiving $3\frac{3}{4}d.$ per hour or less, 25 per cent. $4d.$ per hour, and 46 per cent. $4\frac{1}{4}d.$ or above.

The following details as to strikes on the Clyde also throw some light on the course of wages:—

1859. The shipwrights struck against a reduction, with what result is not known.

1866. Clyde.—General strike for decrease in hours and rise in wages. This was apparently started by the shipwrights, and became a lock-out of the whole trade. As a result, the hours were reduced from 60 to 57, and payment by the hour was introduced.

1877. The shipwrights struck for a return of a reduction which had been made in 1874. Apparently the reduction was general, affecting all skilled operatives in shipyards and engine shops, at least in the upper reaches of the Clyde, and the case of the

shipwrights being submitted to arbitration, it was decided that the state of trade did not warrant the advance sought. The decision of the arbitrator really decided the question of an advance for all the trades concerned.

1878. The engineers, shipwrights, shipjoiners, and smiths submitted to a $7\frac{1}{2}$ per cent. reduction.

1879. The engineers submitted to another reduction, and their hours were increased from 51 to 54.

1884. The engineers, who had received at least two advances of $7\frac{1}{2}$ per cent. in 1880-81, accepted a reduction of $7\frac{1}{2}$ per cent.

1895. The engineers struck for an advance. This strike was stated to be for an equalisation of the Glasgow rates with the Greenock rates, which the Amalgamated Society of Engineers' annual reports stated were 32s. $7\frac{1}{2}$ d. for fitters, turners, and smiths at Greenock, and 30s. $4\frac{1}{2}$ d. at Glasgow. This, however, appears to be an error, as the strike extended to Greenock, where the men refused to return to work unless they received an advance to 7d. per hour (31s. 6d.) for all under that rate, and then an all-round advance of $\frac{1}{4}$ d. per hour. The result of the strike was an advance of $\frac{1}{4}$ d. per hour to all those whose rates were under 7d. per hour, and another $\frac{1}{4}$ d. per hour all round. A return issued by an Employers' Association gives the rates and changes as follows:—

Occupation.	Wage at 1st January, 1896.			Advance on 26th January, 1896. Amount.	Bringing Rate to		
	d.	s.	d.		d.	s.	d.
Fitters	$6\frac{3}{4}$	(30	$4\frac{1}{2}$)	$\frac{1}{2}$	$7\frac{1}{4}$	(32	$7\frac{1}{2}$)
Finishers	7	(31	6)	$\frac{1}{4}$	$7\frac{1}{4}$	(32	$7\frac{1}{2}$)
Turners	7	(31	6)	$\frac{1}{4}$	$7\frac{1}{4}$	(32	$7\frac{1}{2}$)
Planers	7	(31	6)	$\frac{1}{4}$	$7\frac{1}{4}$	(32	$7\frac{1}{2}$)

Returns showing the predominant rates in 1886, 1888, and 1894 indicated that fitters were generally paid $\frac{1}{4}$ d. per hour less than turners, while the changes in the standard rate show that in 1895 Glasgow engineers were $\frac{1}{4}$ d. per hour under Greenock, so that this equalisation was apparently twofold, bringing the fitters' rates to equal the turners', and establishing uniformity between the upper and lower reaches of the Clyde.

TABLE 4.—THE TYNE. *Time Wages for an Ordinary*

Year	1834.	'40.	'50.	1859.	1860.	'65.	'67-68.	'67-68.	'69.	1871.	Sept., 1871.	Nov., 1871.	1872.	'73.	'73.	'78.
Authority	(a)	D.	D.	J.	D.	O.	D.	D.	J.	D.	O.	O.	I.	O.	J.	J.
						Numbers Employed.					60 Hours.	57 Hours.		Numbers Employed.		
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Foundries and engine shops— Patternmakers...	—	{ 25 26 27 22 23 25	{ 21 22 23 23 24 25	{ 24 2	{ 24 25 27 26 28 29	24	25 to 28	—	24 1	26	26 8	26 8	—	20 30	6 29	6
Ironmoulders, sand	—	{ 22 23 25	{ 23 24 25	{ 29	{ 26 27 28 29	138	20 to 30	20 to 29	28	28	27 1	27 2	—	122	28 6	30 3
Ironmoulders, loam	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dressers.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Foundry labourers	—	13 6	{ 12 14	—	14, 15	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders...	—	—	—	—	—	9	—	—	—	—	27 5	27 10	—	14	—	—
Brassfinishers ...	—	—	—	—	—	—	—	21 to 27	—	—	—	—	—	—	—	—
Fitters	—	{ 24 26 28	{ 21 22 24	27 10	{ 24 26 28	164	22 to 30	20 to 22	28	24 to 30	26 9	26 11	{ 28 30	219	28	29 6
Erectors	—	—	—	—	—	—	—	—	—		—	—		—	—	—
Turners	{ 18 20	{ 27 28 29	{ 24 25 27	28	{ 26 28 30	—	22 to 30	27, 28	28 2	—	—	—	—	—	27 2	29 6
Millwrights	20, 22	—	—	—	—	—	—	26	—	28	—	—	—	—	—	—
Machine-men ...	—	—	—	—	—	121	—	—	—	—	26 9	27	—	101	—	—
Planers	—	—	—	—	—	—	—	20 to 24	—	24, 26	—	—	—	—	—	—
Shapers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Slotters	—	—	—	—	—	—	—	22, 24	—	—	26 9	27	—	—	—	—
Borers.....	—	—	—	—	—	—	—	20 to 26	—	—	—	—	—	—	—	—
Screwers	—	—	—	—	—	—	—	20, 22	—	18	—	—	—	—	—	—
Machine drillers	—	—	—	—	—	—	—	20	—	20	19	19 1	—	—	—	—
Hand drillers ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smiths ...	{ 18 20	{ 25 26 27	{ 22 6 24 6 25 6	{ 28 6	{ 25 26 28	57	20 to 29	—	26 6	24 to 30	26 6	26 7	29	54	27	29
Strikers	—	{ 15 16 15 6	{ 14 6 15 6	{ 18 9	{ 17 18	—	12 to 20	12 to 19	19 9	17, 18	17 10	17 8	20	—	19 9	18 9
Coppersmiths ...	—	—	—	—	—	8	—	—	—	—	38	35 2	—	12	—	—
Joiners	18, 20	22	20	24 2	24	23	24 to 28	—	24 1	28	26 1	26 5	—	22	30 6	29 6
Plumbers	—	—	—	—	—	6	—	—	—	—	28 4	28 4	—	7	—	—
Tinsmiths	—	—	—	—	—	{ 26 to 25 & 26	—	—	—	23	—	—	—	—	—	—
Grinders	—	—	—	27 2	—	—	20 to 26	—	28 6	—	—	—	—	—	28	25 3
Painters	—	—	—	—	—	6	—	24	—	—	27	28	—	8	—	—
Labourers	15	15	13	—	15, 16	129	—	14, 18	—	14, 18	17 8	17 10	—	144	—	—

(a) *Returns of Wages*, pp. 22 and 42.* This table should be used in conjunction with that given in the *Journal*, March, 1905, pp. 110 and 111.

*Week's Work in Engineering, 1834—1904.**

Sept., 1882.		1883.†	1884.	1884.	Mar., 1886.	'86.	'86.	'88.	'90.	1892.	1893.	1894.	1897.	1901.		1904.	
O.		E.	K.	Z.	O.	Z.	L.	Z.	L.	H. H.	H.	Z.	Z.	P.		P.	
54 Hours.																	
Number.	Wage.				54 Hours.									Number.	Wage.	Number.	Wage.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.		s.		s.
23	33/11	31to34	—	32	34	32	—	34	—	{ 33/6 to 42/6 }	{ 33/6 to 34/6 }	33, 6	37	31	33/2	27	38
188	30/1	33	31/10	33	30/9	32	—	34	—	{ 30 to 40 }	{ 32/6 to 33/6 }	31/6 to 33/6 }	35	60	36/5	36	35/4
—	—	—	—	34	—	33	—	34	—	—	{ 32/6 to 33/6 }	{ 30 to 34/6 }	35/6 to 37				
—	—	—	—	—	—	—	—	—	—	—	{ 20 to 27/6 }	{ 23 to 25/6 }	26 to 28				
—	—	—	—	19	—	19	—	19	—	{ 20 to 25 }	{ 19/6 to 20/6 }	20 and 20/6 to 22/6 }	—				
27	29/10	—	—	32	30/3	34	—	36	—	—	{ 31/6 to 34/6 }	31/6 to 36 to 38	—	22	36/4	18	35/10
—	32/1	—	—	32	32/6	31	—	32	—	—	{ 28 to 33/6 }	30/6 to 33/6 }	35				
246	32/5	31to34	—	32	32/5	30	30	32	35	33to39	31/6	31/6	35	297	361	330	34/10
—	—	—	—	32	—	30	—	32	—	—	31/6	31/6	35	—	—	—	—
—	—	34	—	32	—	32	—	32	—	33to39	31/6	31/6	35	—	—	—	—
—	—	—	—	33	—	30	—	32	—	—	31/6	31/6	35	—	—	—	—
170	31/3	34	—	—	29/11	—	—	—	—	20to37	{ 18to 28/6 }	—	—	116	32/7	75	31/4
—	—	34	—	29	—	20	—	20	—	—	20to34	20to34	20to37	—	—	—	—
—	—	—	—	26	—	20	—	20	—	—	20to28	20to34	20to33	—	—	—	—
—	—	34	—	28	—	20	—	20	—	—	20to29	18to29	22to35	—	—	—	—
—	—	—	—	20	—	20	—	20	—	—	{ 19to 27/6 }	18to24	—	—	—	—	—
—	—	—	—	20	—	20	—	20	—	—	{ 21/6 to 27 }	20to26	19to33	—	—	—	—
—	21/6	24	—	20	21/3	20	—	20	—	—	{ 19/6 to 27 }	19 to 32/6	21/6 to 22 to	28/5	—	—	29/1
—	—	—	—	20	—	20	—	20	—	—	{ 20/6 to 26 }	20/6 to 24	22 to 39/6 }				
61	32	31to34	32	34	31/6	30	30	32	35	34to38	29to36	29to37	36/6	29	36	22	36/2
—	18/9	20to23	18	24	19	18	19	20	21	22	20to23	18to23	20to26	—	21/7	—	21/7
24	34/10	—	—	—	33/2	—	—	—	—	—	{ 32/6 to 34/6 }	30 to 34/6 }	—	44	37/3	20	36
27	33/9	—	—	—	32/5	—	—	—	—	—	{ 30to 37/6 }	35	—	32	39	24	38/5
17	32/7	—	—	—	31/9	—	—	—	—	—	33	33	—	26	35/10	13	35/11
—	—	—	—	—	—	—	—	—	—	—	{ 28 to 30/6 }	—	—	3	—	3	—
—	—	—	—	24	—	24	—	24	—	—	—	20to27	{ 20/6 to 38 }	—	—	—	—
10	28/4	—	—	—	26	—	—	—	—	—	29to31	{ 29to 33/6 }	—	9	34	—	—
212	20/7	23	—	19	20/4	18	18	18	21	20	{ 18to 21/6 }	18to20	21/6	405	22	500	22

† South Shields and neighbourhood.

TABLE 4.—THE TYNE. *Time Wages for an Ordinary Week's*

Year	1834.	'40.	'50.	1859.	1860.	'65.	'67-68	'67-68.	'69.	'71.	Sept., 1871.	Nov., 1871.	1872.	'73.	'73.	'78.
Authority	(a)	D.	D.	J.	O.	O.	D.	D.	J.	D.	O.	O.	I.	O.	J.	J.
						Numbers Employed.					60 Hours. 57 Hours.				Numbers Employed.	
	s.	s.	s.	s.	s.			s.	s.	s.			s.	s.	s.	s.
Boiler shops—																
Boiler-makers ...	—	—	—	31/4	—	—	—	—	30	30	—	—	—	—	32/6	30/6
Angle iron- smiths	—	—	—	—	28†	—	—	—	—	—	34	34	—	—	—	—
Platers	—	25†	21†	—	27†	184	30	—	—	—	30/6	30/6	35	245	—	—
Riveters	—	21†	20†	—	26†	—	26	—	—	—	29	29	32, 35	—	—	—
Caulkers	—	—	—	—	—	—	—	—	—	—	26/8	26/8	—	—	—	—
Holders-up	—	15†	18†	22/6	16†	—	19	—	23/9	—	22	22	24, 26	—	24/9	23/9
Labourers	—	—	—	—	—	—	16	14, 18	—	—	17/5	17/5	—	—	—	—
Angle smiths' } strikers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	—	—	—	—	—	—	—	—	—	—	29	29	—	—	—	—
Strikers	—	—	—	—	—	—	—	—	—	—	20/7	20/6	—	—	—	—
Planers	—	—	—	—	—	—	—	—	—	—	25	25	—	—	—	—
Drillers	—	—	—	—	—	—	—	—	—	—	22/6	22/6	—	—	—	—
General work §—																
Blacksmiths	—	19	22	—	24	—	—	—	—	—	—	—	—	—	—	—
Millwrights	—	21/6	24	—	26	—	—	—	—	—	—	—	—	—	—	—
Labourers	—	13	11	—	16	—	—	—	—	—	—	—	—	—	—	—

* This table should be used in conjunction with that given in the *Journal*, March, 1905, pp. 110 and 111.

† South Shields and neighbourhood.

*Work in Engineering, 1834—1904.—Contd.**

Sept., 1882.		1883.†	1884.	1884.	Mar., 1886.	'86.	'86.	'88.	'90.	1892.	1893.	1894.	1897.	1901.	1904.	
O.	E.	K.	Z.	O.	Z.	L.	Z.	L.	H H.	H.	Z.	Z.	P.	P.		
54 Hours.																
Number.	Wage.				54 Hours.								Number.	Wage.	Number.	Wage.
—	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	—	s.	—	s.
290	39	—	—	34	38	34	—	35	—	—	34 6 to 36 6	33 to 37	40 6	41 6	245	40 6
	38 3	38	—	38	37 3	36	35	36	39 6	—	37 11	37 11	40 6 11	39 6	—	38 6
	35	36	—	34	34	32	32	34 6	37	—	35 L	35 L	38 6 L	38 6	—	37 6
	33	—	—	29 6	32	31	—	32 7	—	—	34	34	37 6	38 6	—	37 6
—	28	27	—	24	27	—	26	28	30	—	27	27	30 6	32	—	31
—	20 3	—	—	26	19 11	18	—	20	—	—	20 to 21 6	20 to 22	—	22 6	—	21 9
—	—	—	—	—	—	—	—	—	—	—	—	20 to 23	—	—	—	—
—	31/10	—	—	—	29 3	—	—	—	—	—	33 to 34 6	31 to 34 6	—	37 6	—	35 10
—	21 6	—	—	24	21 3	—	23	—	21	—	—	22 6	—	25	—	24 9
—	25	—	—	—	25 6	—	—	—	—	—	—	—	—	29 8	—	26 6
—	23 5	—	—	23	22 10	—	22	—	24	—	—	24 to 26	—	28 6	—	27 6
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

† The Returns do not give the figures in this way, but they seem to fit this classification best.

§ From p. 401 of *Returns*.

TABLE 5.—THE TYNE. *Wages for an Ordinary*

Date	—	1859.	1861.	1867-68.	1869.	1871.	Sept., 1871.	Nov., 1871.	1873.	1878.	Sept., 1882.
Authority	—	J.	D.	D.	J.	D.	O.	O.	J.	J.	O.
	Time or Piecework.			Number.	Wage.	Number.	Wage.				
		s.	s.		s.		s.	s.	s.	s.	s.
Anglesmiths	T.	—	—	0·6	28	—	—	—	—	—	—
	P.	—	—	—	60	—	—	45 9	37 11	—	84/10
Platers	T.	31 6	29, 31	2·8	28	33 6	9·50	30	31	31	34
	P.	—	—	—	60	—	—	54 6	67 9	36 6	77 6
Rivetters	T.	—	25, 26	11·5	27	—	10·50	29	30	33 6	33
	P.	—	—	—	51	—	—	34 5	35 6	31 6	51/2
Caulkers and chip- pers	T.	—	24, 26	6·9	24	—	2·00 18 to 20§	28	28	—	31
	P.	—	—	—	42	—	2·50 21	38 6	38 9	—	55/9
Holders-up	T.	22 6	—	5·8	21	23 9	—	—	—	23 9	25/3
	P.	—	—	—	39	—	—	—	—	—	—
Smiths	T.	—	20 to 28	4·4	26	—	3·75 24 to 29	26	26	—	30
	P.	—	—	—	—	—	—	—	—	—	—
Smiths' strikers ...	T.	—	16	6·8	16	—	4·50 13 to 19	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Anglesmiths' strikers	T.	—	—	—	—	—	—	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
Platers' helpers ...	T.	—	17, 18	17·6	16	—	17·25 16 to 24	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—
	P.*	—	—	—	—	—	—	—	—	—	—
Fitters	T.	—	—	1·0	25	—	1·00 24 to 26	26	26	—	29 6
	P.	—	—	—	—	—	—	—	—	—	—
Drillers	T.	—	16	2·8	17	—	2·75 18 to 20	20	20	—	24
	P.	—	—	—	33	—	—	35 7	32	—	34
Patternmakers.....	T.	—	—	—	—	—	—	—	—	—	—
Shipwrights†	T.	—	26, 30	7·6	27	—	6·00 28 to 29	29	29	35 6	37
Ship-joiners	T.	—	25, 26	8·1	27	—	9·00 27 to 30	29	29	—	34 6
Ship-painters	T.	—	18 to 28	3·8	26	—	6 50 18 to 28	28	28	31 6	27 6
Ship-plumbers	T.	28 6	—	0·1	30	28 6	—	—	—	35 6	34
Cabinetmakers.....	T.	—	—	—	—	—	—	—	—	—	—
Sawyers‡	T.	—	24	1·2	26	—	1·00 27	—	—	—	—
Saw-millers	T.	—	—	—	—	—	—	—	—	—	—
Sailmakers	T.	—	—	0·4	30	—	—	—	—	29 6	29 6
Riggers	T.	—	—	0·6	27	—	—	27	27	16	30
Mast and block- makers	T.	—	—	0·2	—	—	—	—	—	—	—
Redleaders	T.	—	—	1·3	17	—	—	—	—	—	—
Labourers	T.	—	14, 15	5·2	15	—	15 to 18	—	—	22 8	23 9

* Time-workers working with platers on piecework.

† Time-workers working with anglesmiths on piecework.

‡ The *Returns of Wages*, p. 42, states that sawyers had 21s., and shipwrights 27s. in 1834.

Week's Work in Shipyards, 1859—1905.

'83.	'84.	1884.	Mar., 1886.	'86.	1886.	North-East Coast, 1886.	1888.	1890.	'93-94.	May, 1898.	1901.	1904.	1905.	
P.	Z.	K.	O.	Z.	L.	G.	Z.	L.	H. Z.	Z.	P.	P.	Z.	
						Number.	Wage.				Number.	Wage.	Number.	Wage.
s.	s.	s.	s.	s.	s.		s.	s.	s.	s.		s.	s.	s.
—	33	—	—	32	32	—	—	33 6	36	34	36 6	—	—	35
—	—	—	55 3	—	61 6	8	54 1	—	84	—	—	7	109	3
—	33	33	32	32	32	—	—	33 6	36 6	34	36 6	15	38	6
—	—	—	57 1	—	64 6	73	61 6	—	87	—	—	96	97 6	26
—	31	33	33	30	30	67	30	31 6	34 6	32	34 6	9	36	10
—	—	—	37 3	—	51	148	40 8	—	64 6	—	—	136	59	8
—	31	31	30	30	30	12	30	31 6	34 6	32	34 6	13	36	8
—	—	—	40 7	—	49 6	42	49	—	63	—	—	48	71 6	7
—	25	—	—	24	—	32	24	25 3	—	26 6	28 6	—	—	—
—	—	—	—	—	—	80	35	—	—	—	—	—	—	—
—	30/6	32	29 6	30	31	28	30 8	33	35	33 6	34 6, 36 6	20	37 10	21
—	—	—	—	—	—	23	49 4	—	—	—	—	—	—	—
—	21/6	—	—	19	19	12	20 3	21 6	23	23	24 6	—	—	—
—	—	—	—	—	—	36	31 11	—	—	—	—	—	—	—
—	—	—	—	—	—	4	26 6	—	—	{ 20	23 6 to	—	—	—
—	—	—	—	—	—	6	32	—	36	{ 22 6	32	—	—	—
—	18	—	—	18	18	—	—	18	19	30†	—	—	—	—
—	—	—	—	25	192	24 8	—	30	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	29, 32	—	—	—
30/6	31	33 6	28	28	28	56	29 4	32	35	31 6	35	141	35 11	189
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	20	—	19	—	19, 22	8	22 6	23	23, 25	22, 24	23 6, 29	2	30	11
—	—	—	25 8	—	30	41	34/10	—	37	—	—	75	54 6	16
—	—	35	—	—	—	—	—	—	—	33 6	37	—	—	—
37	34	35	34	33	33	153	33 1	34 6	38/6	36	39	272	40 6	155
33	32	33	32	31	31	107	30/3	32/6	36 6	35	38	220	39 6	239
—	—	28	28	—	28	44	28/4	—	32	31	33	40	34 3	74
—	—	—	—	—	—	5	29/10	—	—	33	35	—	—	—
—	—	—	—	—	—	—	—	—	—	35	38	—	—	—
37	—	32	—	—	—	—	—	—	—	34	—	—	—	—
25	—	—	—	—	—	10	30/6	—	—	20	—	—	—	—
30	—	—	28	—	—	8	29/10	—	—	{ 30	—	—	—	—
—	—	—	—	—	—	—	—	—	—	{ 30	30	21	30 4	36
—	—	—	—	—	—	—	—	—	—	36	—	—	—	—
—	—	—	—	—	—	94	20 2	—	—	20 6	21 6, 22	—	—	—
20	18	—	—	18	17 6	223	19 1	18	19	20	20, 21	—	—	—

§ Chippers.

(1) The tables given on pp. 110—111 of the *Journal of the Royal Statistical Society* for March, 1905, should be used in conjunction with this tabulation.

TABLE 6.—SUNDERLAND. *Wages for an ordinary*

Year	—	1877.	1883.	1883.	1884.	1884.	1884.	1885.	1886.	'86-'87.	1888.
Authority	—	D.	D.	P.	K.	Z.	P.	P.	Z.	P.	Z.
	Time or Piece Work.	Num- ber.	Wage.	Num- ber.	Wage.						
		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Angle smiths§	T.	—	—	1	35	—	—	—	—	—	—
	P.	—	—	—	60 to 100	—	—	—	—	—	—
Angle smiths' strikers	T.	—	—	—	—	—	—	—	—	—	—
	P.*	—	—	—	—	—	—	—	—	—	—
Platers	T.	5	34	8½	36	36	33	33	33	33	33/6
	P.	—	—	—	65 to 105	100	—	—	82½	75	67½
Rivettters	T.	12	32	11	34	34	32	—	31	31	30
	P.	—	—	—	42 to 60	100	—	—	87½	82½	—
Caulkers	T.	3	32	2½	34	34	35?	31	31	31	30
	P.	—	—	—	50 to 60	100	—	—	82½	75	—
Holders-up	T.	6	26	5½	27/6	27/6	26	—	25	25	24
	P.	—	—	—	35	—	—	—	—	—	—
Platers' helpers	T.	25	24	17	25	—	—	—	—	—	14
„ outside	P.*	—	—	—	—	28/6	—	—	27	26	—
„ „ blocks and boards	P.*	—	—	—	—	31/6	—	—	30	28/6	—
Shipwrights	T.	7	36	11½	34	37	35	34	34	34	32/6
Shipjoiners	T.	6	33	4½	33/6	35	33	32	32	32	30/6
Ship painters	T.	3	32	2	31/6	—	33	—	—	—	—
„ plumbers	T.	—	—	—	—	—	—	—	—	—	—
Sailmakers	T.	—	—	—	—	—	30	—	—	—	—
Smiths	T.	4	33	4	34	35	33	32	32	32	30
	P.	—	—	—	52	100	—	—	87½	82½	—
„ strikers	T.	4	14†	4½	20	—	20	—	—	—	19
	P.	—	—	—	30	—	—	—	—	—	—
Fitters	T.	2	33	—	—	—	29	—	—	—	28
Redlenders	T.	—	—	—	—	—	—	—	—	—	29/6
Drillers	T.	2	27	4	27	28	28	24	26	26	25
	P.	—	—	—	41 to 50	100	—	—	87½	82½	—
Sawyers	T.	—	—	1	35	—	—	—	—	—	—
Sawmillers	T.	2	28	½	31	—	—	—	—	—	—
Cabinetmakers	—	—	—	—	—	—	—	—	—	—	—
Mast and block makers	—	—	—	—	—	—	33	—	—	—	—
Labourers	T.	3	21	5½	18 to 21	—	21	21	—	—	18

* Timeworkers working with platers or anglesmiths on piecework.

† Lads and boys.

‡ 1887.

Week's Work in Shipbuilding, 1877—1905.

1888.	1889.	1890.	1891.	1892.	1893.	93-95.	1894.	1896.	1897.	May, 1898.	1898-1901.	1902.	1903.	1904.		1905.
P.	P.	P.	P.	P.	II.	P.	Z.	P.	P.	Z.	P.	P.	P.	P.		P.
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	Number.	Wage.	s.
—	—	—	—	—	34	—	34	—	—	36 6	37	35 6	—	1	35 6	34
+5%	+10%	+5%	—	-10%	—	-5%	—	+5%	+5%	—	+5%	-5%	—	—	-5%	-5%
—	—	—	—	—	—	—	—	—	—	33	—	—	—	—	—	—
33/6	35/6	36 6	36 6	35	34	34	34	35 6	36 6	36 6	38	36/6	36 6	18	36/6	35
72½	82½	87½	87½	77½	—	72½	—	77½	82½	—	87½	82½	82½	—	77½	72½
31/6	33/6	34/6	34/6	33	32	32	32	33 6	34/6	34/6	36	34/6	34/6	34	34/6	33
82½	92½	97½	97½	87½	—	82½	—	87½	92½	—	97½	92½	92½	—	87½	82½
31/6	33/6	34/6	34/6	33	32	32	32	33 6	34/6	34/6	36	34/6	34/6	9	34/6	33
75	85	90	90	80	—	75	—	80	85	—	90	85	85	—	80	75
25/6	27/6	28/6	28/6	27	26	26	26	27 6	28/6	28 6	30	28/6	28 6	16	28 6	27/6
+5%	+10%	+5%	—	-10%	—	-5%	—	+5%	+5%	—	+5%	-5%	—	—	-5%	—
28/6	29	30	30	28	—	27	27	28	29	29	30	29	29	} 58 {		29
30	32	33	33	31	—	30	30	31	32	32	33	32	32	—	32	31
34	36/6	38	38	37	35/6	35/6	35 6	37	38 6	38 6	40	38/6	38 6	18	38 6	37/6
32	34/6	36	36	35	33/6	33/6	33 6	35/6	37	37	38/6	37	37/6	10½	37 6	36/6
—	—	—	—	—	—	—	—	32 6	33/6	33/6	—	33/6	33/6	2½	33 6	33/6
—	—	—	—	—	33	33	33	34	35	35	36	36	36	2	36	36
31/6	34/6	36	36	35	33/6	33/6	33 6	35	36 6	36 6	38	36/6	36 6	6	36 6	34
87½	97½	102½	102½	97½	—	92½	—	97½	102½	—	107½	102½	102½	—	97½	92½
—	—	—	—	—	—	—	—	+1s.	—	—	—	—	—	—	—	—
—	—	—	—	—	32 6	—	32 6	—	—	—	—	—	—	—	4	35
26	28	28	28	27	26	26	26	27	28	28	29	28	28	11	28	27
82½	92½	97½	97½	92½	—	87½	—	92½	97½	—	102½	97½	97½	—	92½	87½
—	—	—	—	—	—	—	—	Changed with joiners	—	—	—	—	—	1½	37/6	36/6
—	—	—	—	—	—	—	33/6	Changed with joiners	—	—	—	—	—	1	37 6	36/6
—	—	—	—	—	33 6	—	—	—	—	—	—	—	—	—	37 6	36/6
—	—	—	—	20 6	—	20	20	21	21/6	20, 21	22	21/6	21/6	36	21/6	—

§ The anglesmiths were either the same as, or 1s. under, platers since 1884.

|| The numbers in italics show the relation of piece prices to those of 1883.

TABLE 7.—SUNDERLAND. *Time Rates of Wages for an Ordinary Week's Work in Engineering, 1883—1904.*

Year	1883.	1884.	1886.	1888.	1893.	1894.	1896.	1897.	1887.	1888.	1889.	1890.	1891.	1892.	93-95.	1896.	1897.	1898.	1899-1902.	1903-04.
Authority	A.	Z.	Z.	Z.	H.	Z.	Z.	Z.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	P.&Y.	
Engine shops—																				
Patternmakers.....	36	32	30	34.6	33.6	33.6	35.6	40	32	34	36	37	37	35.6	33.6	35.6	37	38	38	38
Ironmoulders, and	{	30	—	29.6 to 30	30	31.6	33.6	—	31	33	35	36	36	33.6	31.6	33.6	35	36	37	36
Ironmoulders, team		—	—	20 to 25	25	26.6	—	—	—	—	—	—	—	26	25	26.6	—	—	—	—
Dressers.....	—	—	—	—	20	18 to 21.6	19 to 22.6	—	—	—	—	—	—	—	—	—	—	—	—	—
Foundry labourers ..	34	32	33	35	34.6	30 to 36	32 to 38	—	30	32	34	36	36	34.6	32.6	34.6	36	37	37	36
Brass moulders	35	32	32	30.6	31.6	30 to 32	32 to 34	—	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Brass finishers	35	32	30	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Fitters	35	32	30	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Erectors	35	32	30	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Turners	35	32	30	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Millwrights	35	32	32	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Planers	30	27	26	25.6	28	20 to 32.6	21 to 34.6	27	—	—	—	—	—	—	—	—	—	—	—	—
Slapors	32	30	25	27.6	27.6	26.6 & 27.6	28.6 & 29	—	—	—	—	—	—	—	—	—	—	—	—	—
Shotters	32	30	25	27.6	27.6	26.6 & 27.6	28.6 & 29	—	—	—	—	—	—	—	—	—	—	—	—	—
Smiths	36	32	30	32	31.6	31.6	33.6	35	30	32	34	35	35	33.6	31.6	33.6	35	36	36	35
Strikers	21	21	19	20	20 & 20.6	20	21	—	—	—	—	—	—	—	—	—	—	—	—	—
Fitters' labourers	21.9	18	19	—	—	18 to 20	19 to 21	20	—	—	—	—	—	—	—	—	—	—	—	—
Machine screwers ..	25	21.6	21	22	22.6	19 to 23.6	20 to 24.6	—	—	—	—	—	—	—	—	—	—	—	—	—
Machine borers	24	22	22	22	25.6	20 to 29	21 to 31	—	—	—	—	—	—	—	—	—	—	—	—	—
Machine drillers	{	23.6	22	22	22.6	20 to 25.6	21 to 27	27.6	—	—	—	—	—	—	—	—	—	—	—	—
Hand drillers		22	22	20	20	20 to 24	21 to 25	—	—	—	—	—	—	—	—	—	—	—	—	—
Grinders	37	35	32.6	—	23 to 25.6	28 to 38	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Joiners	34	—	—	—	32.6	—	35.6	—	—	—	—	—	36	31.6	33.6	—	—	—	—	—
Coppersmiths	—	—	—	—	34 to 36	34 to 36	36 to 38	—	—	—	—	—	—	—	32.6	33.6	36	37	37	36
Painters	—	—	—	—	32 & 35.6	31 to 33.6	32 to 34.6	—	30	30, 32, 32, 34.6	33, 35	34, 35	—	33.6	33	34	35	36	36	36
Plumbers	—	—	—	—	33	33	34	—	28	29	30	30	30	30	30	32	—	—	—	—
Tinsmiths	—	—	—	—	30	32	32	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	21	—	—	—	19—20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Boiler shops—																				
Angle-smiths	—	36	37.6	37	37	37	39	38 to 41.6*	36	38	40.6	40.6	40.6	39	37.6	39	40.6	41.6	41.6	40.6
Platers, heavy	{	37	34	36.6	35.6	37.6	39.6	40.6	36.6	38.6	41	41	41	39.6	37.6	39.6	41	42	42	41
Platers, light		—	—	—	—	35.6	37.6	38.6	—	34.6	36.6	39	39	39	36.6	35.6	37.6	39	40	40	39
Barriers	37	31	32	34.6	34	34	36	37.6 & 38	32.6	34.6	37	37	37	35.6	34	36	37.6	38.6	38.6	37.6
Caulkers	—	34	32	34.6	34	34	36	37.6 & 38	32.6	34.6	37	37	37	35.6	34	36	37.6	38.6	38.6	37.6
Holders-up	27	25	25	27.6	28	27.6	29	30	26	28	30.6	30.6	30.6	29	27.6	29.6	31	32	32	31
Hand drillers	22	22	23	20.6	—	21.6	22.6	—	—	—	—	—	—	—	—	—	—	—	—	—
Strikers	—	18	18	21.6†	20†	21	21	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	—	20	19	20†	20†	20, 21	20, 21	—	—	—	—	—	—	—	—	—	—	—	—	—

* The rates for boiler-makers in this column refer to the "North-East Coast."
† Anglesmiths' strikers. Blacksmiths' strikers were 22s. in 1893 and 19s. to 20s. 6d. in 1894.
‡ Platers' helpers. In 1893 the same rate is given for labourers.

NORTH-EAST COAST.

The table relating to the North-east Coast, given on pp. 110 and 111 of the *Journal* for March, 1905, shows all the most important changes in wages in that district, the greater part of which, since 1888, have been simultaneous and equal over the whole area. The exceptions, save in the case of Middlesbro', were mainly by way of equalisation. Before 1888 in the engine shops, and 1884 in the shipyards, this was not the case, and it therefore seems desirable to bring together the non-statistical or scattered evidence relating to the prior years: this has been done in the following notes:—

Mr. J. Price, of the Jarrow Shipyard, who handed in the table to the Trade Depression Commissions of 1886, containing the figures shown in Tables 4 and 5 for 1865, 1871, 1882, and 1886, O, gave evidence to the Royal Commission on Trade Unions in 1868. His remarks relate to the Tyne. There he stated that from 1858 to 1866 wages had steadily risen with the prosperity of trade. He mentions platers, rivetters, caulkers, fitters, painters, smiths, carpenters, riggers and labourers in this connection. A depression began in 1866. Wages were reduced, and as examples of the reductions he said that ship-platers received 36s. in 1866, and were reduced to 33s. and then to 30s., while rivetters, who had 9s. 6d. per hundred rivets, were first reduced to 9s. and then to 8s. 4d.

Again, speaking mainly of the Tyne, in his evidence to the Commission on Trade Depression he stated that while wages in 1885 were above 1871, they had been higher. The drillers were not as high as in 1871, as they had been substituting unskilled for skilled workmen. They had received four reductions from the iron shipbuilders between January, 1884, and the end of 1886, and this was the most they could expect. From the engineers they had received two reductions since 1882, the first being 1s. and the second (which took place in 1886) 1s. 6d. off all rates over 32s., and 1s. off all at 32s. and under. [These reductions would apparently affect pattermakers, smiths, brassfinishers, coppersmiths, fitters, turners, planers, slotters, and perhaps some others.] The labourers had also been reduced.

W. Allen, Secretary of the Amalgamated Society of Engineers, told the 1867 Commission on Trade Unions that "away in the North of England wages have improved vastly within these few years—year after year almost, but this has arisen from the fact of the large amount of shipbuilding going on at Newcastle and the different parts round there, as well as on the Clyde."

Edward Young visited Newcastle, and records that the 9 hours' movement started in this district, and that immediately after the 54 hours' week was obtained wages rose. He gives as a typical instance the engineers, who in 1871, previous to the strike, had 26s., and in 1872 had obtained 30s.

This evidence of Edward Young is substantiated by a witness who was thoroughly acquainted with the engineering trade on the

Tyne during the period 1865-73, who informed one of the present writers that in 1865 and the early part of 1866 engineers' wages were about 25s. or 26s., and that a fall took place during the depression to 24s. or 25s. At the end of 1870 they were about the same, and the subsequent rises dated from the commencement of 1871. Wages were rising throughout that year, but mainly by individual bargainings, not concerted movements. After the strike for the 9 hours' day was over wages went up rapidly, the maximum being 6s. or 7s. above the commencement of 1871. This movement was typical of the skilled workers in engine shops.

The United States Consul, who reported on the Tyne district in 1878, speaks of 1873 as having "prosperity without precedent in the history of the district, extended to every branch of industry." In 1884 he writes, referring to engineering and shipbuilding, of 1878 as having been depressed, 1878-79 being the culminating period, from 1879 to 1881 getting better; in 1882 and the first half of 1883 the "flood of good times reached its height, and wages were raised in all branches," while 1884 was "worse than 1878."

From trade union reports we learn that at Sunderland engineers in 1870 got 28s., but that at the Tyne wages were lower. In 1873 the Middlesbro' engineers struck for a rise. In 1875 the Newcastle employers are reported to be trying to reduce wages by bringing in men at lower rates, and the maximum point seems to have been passed. [There seems substantial evidence that reductions took place between 1873 and the end of 1875, one of the witnesses at the Clyde shipwrights' arbitration in 1877 said that when the reduction on the Clyde was made in December, 1874, shipwrights were reduced on the Tyne. Mr. Wilkie, Secretary of the Shipwrights' Society, said that there was an advance in 1874, by award of Mr. Hughes as arbitrator, and a reduction of 2s. in 1875, agreed to by a conciliation board. This apparently applies to Walker and Jarrow. There was no reduction at the Tees or Wear in that year. The co-operative smiths report a strike against a reduction on the Tyne in 1875, which "ended to the advantage of the members."] In 1881 the engineers report that rises took place generally on the Tyne and Wear, and that a great change for the better had taken place in shipbuilding districts. In March, 1882, the Sunderland engineers are reported to have for "years past" had 3s. or 4s. higher rates than their neighbours in Newcastle, and that in January, 1881, they had an increase of 2s., and now had received 2s. more. In April of that year rises are reported at Newcastle, Hartlepool, and Shields, the latter being of 2s. In 1883 the Sunderland engineers, then receiving the highest rate they ever had, asked for another rise, and received an increase of 2s. to those at 35s. or under, and 1s. to those at over 35s. This would indicate that they then received 37s., which was not only higher than they ever had before, but higher than they have ever had since. A strike on the apprentice question took place immediately after, which lasted throughout 1884, and ended in submission in 1885. In 1883 the Hartlepool engineers received an

advance, and in 1886 they struck against reductions, in one case of 4s., in four cases of 3s., in thirty cases of 2s., and in many cases of 1s.

The co-operative smiths in 1878 reported that while shipsmiths were fairly employed, engine work had fallen off considerably. At Sunderland they had submitted to reductions of 2s. and $7\frac{1}{2}$ per cent., and at the Tyne were under notice of reduction of 2s. and 10 per cent. In 1879 we find that no change had taken place in the time wages, but that 5 per cent. had been taken off piece rates, while at Sunderland 2s. had been taken off time rates, and a piece reduction was not then (early in 1880) settled. At the commencement of 1884 they report that they are under notice for a reduction of all rises received since 1880 (apparently Tyne and Wear), and at the end of the year the report states that wages were then as in 1879, and that wages and materials were, as in that year, at their lowest.

The course of wages at Sunderland shipyards and engine shops after this date may be traced in Tables 6 and 7, and those at the Tyne may be traced in the table in Part A, pp. 110 and 111 of the *Journal* for March, 1905. The chief gap in the records since 1870 is that we do not know the course of the boilermakers' wages from 1878 to 1887.

TABLE 8.—HULL. *Time Rates of Wages for an Ordinary Week's Work in Engineering, 1856—1894.*

Year	1856-58.	1861.	1863.	1866.	1884.	1884.	1884.	1886.	1888.	1893.	1894.
Authority	A.C.	C.	A.	A.	K.	Z.	Z.	Z.	Z.	H.	Z.
Engine shop and foundry—	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Patternmakers*	—	—	26	28	32/6	32	34	32	34	34	34
Ironfounders	30†	—	21, 30	30	33 6	32, 34	34, 36	32	34, 36	34, 36	34, 36
Dressers	—	—	—	—	—	—	—	—	—	24 6	24 6
Foundry labourers	—	—	—	—	22 6	20	20	20	20	20 6	20, 20 6
Engineers	27	—	26	—	—	—	—	—	—	—	—
Fitters	—	—	28 6	30	29 6	29	31	29	31	31	31
Turners	—	—	27	30	29 6	29	31	29	31	31	31
Erectors	—	—	28	—	—	29	31	29	31	31	31
Millwrights	—	—	26	—	—	29	31	—	—	—	—
Planers	—	—	—	24	} 22 6		22	23	22	—	22, 28
Shapers	—	—	—	24			22	23	22	—	23 6, 30
Slotters	—	—	—	20			22	23	22	—	22, 28
Set-screws	—	—	—	20			22	20	22	—	22, 28
Borers	—	—	—	20	29 6	26	—	28	—	—	22 6, 28
Drillers	—	—	—	20	—	21, 21/6	22, 22 6	21, 23	22, 22 6	23 6	21 6, 23
Joiners	—	—	—	28	—	—	—	—	—	33	—
Brassfounders	34	28, 30	—	—	—	34	34	—	34	34	34
Brassfinishers	28	28	—	—	29 6	32	30	32	32	32	32
Smiths	—	27, 28	—	21, 32	29 6	29	31	29	31	31	31
Strikers	—	15, 18	20	18	20	21	20	20 6	21	21	20, 22
Labourers	—	18, 21	18	18	18/9	19	18	18	18	—	20, 22
Boiler shop—	—	—	—	—	—	—	—	—	—	—	—
Boilermakers	27†	—	26	30†	—	—	—	—	—	—	—
Angleiron smiths	—	—	—	—	—	—	—	—	—	—	—
Platers	—	—	—	36	—	36	37 6	36	37 6	37	37
Riveters	—	—	—	35	—	35	36 6	35	36 6	36	36
Caulkers	—	—	—	30	—	30	31 6	30	31 6	31	31
Holders-up	—	—	—	30	—	30	31 6	30	31 6	31	31
Labourers	—	—	—	18	—	25	26	—	26	26	26
Strikers	—	—	—	—	—	19	20	20	20	20 6	20, 20 6
	—	—	—	—	—	20	—	19	—	20 6	22, 23 6

* In Iron-shipbuilding, 1883, 34s.

† Given under Iron-shipbuilding.

‡ In Iron-shipbuilding, 30s. is also given for 1863 and 1867-68.

TABLE 9.—HULL. Wages for an Ordinary Week's Work in Shipbuilding, 1856—1894.

Year	1850-53.	1861.	1863.	1863.	1866.	1866.	1867-68.	1880.	1883.	1884.	1886.	1888.	1890-92.	1893.	1894.
Authority ..	D.	E.	D.	E.	D.	E.	E.	D.	D.	Z.	Z.	Z.	L.	Il.	Z.
Time or Piece.								Numl. Wage.							
Angleiron smiths ..	T.	8.	8.	8.	8.	8.	8.	0-9	37/6	39	36	37/6	T. 39 P. 77/8	37	37
Angleiron smiths' strikers	T.	—	—	—	—	—	—	1-8	21	—	—	—	—	22	22
Platers	T.	30	33	—	36	—	30	4-1	36	37/6	35	36/6	T. 38 P. 77	36	36
Riveters	T.	27	30	—	30	—	30	8-4	31	32	30	31/6	T. 33 P. 60/4	31	31
Chippers and caulkers ..	T.	—	—	—	24	—	—	3-7	31	32	30	31/6	T. 33 P. 60/1	31	31
Holders-up	T.	—	—	—	—	—	16/6	4-2	25/6	26	25	26	T. 27 P. 45/5	26	26
Platers' helpers	T.	—	—	—	18	—	—	7-4	21	21	21	21	T. 22/6 P. 39/9	20	20, 20/6
Drillers ..	T.	—	—	—	24	—	—	3-4	21	21	21	21	T. 32/6 P. 58/3	21	23/6
Smiths	T.	27, 28	24, 33	30	21, 30	21, 33	27, 33	5-2	28/6	32	29	30	T. 32/6 P. 58/3	31	31—36
Smiths' strikers	T.	—	—	—	—	15, 18	15, 18	6-0	20	21	21	21	—	21	21, 22
Shipwrights	T.	27	27	27	27	33	33	—	30	33	31/6	31/6	34/6	33/6	33/6
Ship joiners	T.	24	24	24	24	28	26, 28	17-5	30	31/6	30/6	30/6	33	33	33
Ship painters	T.	—	—	—	—	—	—	—	—	—	—	—	—	35	35
Sawyers ..	T.	—	—	—	—	24	—	2-6	29/6	29/6	—	—	—	29/6	29/6, 31/6
Sawmill men	T.	—	—	—	—	33	27, 33	1-8	29	30	—	—	—	30	27, 30
Sailmakers ..	T.	21, 24	21	—	—	24	—	—	27	—	—	—	—	—	31/6
Riggers ..	T.	—	—	—	—	—	—	0-6	27	30	—	—	—	—	30
Spurnmakers ..	T.	—	—	—	—	—	—	—	28/6	31	—	—	—	—	32
Fitters ..	T.	—	—	—	—	—	—	5-0	19	—	—	—	—	—	31
Painters ..	T.	—	—	—	—	—	—	2-3	21	—	—	—	—	—	20
Labourers ..	T.	18	16/6, 21	—	—	18	18, 21	10-2	20	20	20	20	21/6	20/6	20/6

* 1855-57, 21s. 1856-58, 24s. 1874, 30s.

TABLE 10A.—HULL. *Standard Time Rates Paid*

Year		1876-77.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Authority		Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.
		s.	s.	s.	s.	s.	s.	s.	s.
Shipyards—									
Angle-iron smiths	T.	39	39	36 6	37/6	39	39	39	36
Platers	T.	36	36	34 6	36	37/6	37/6	37/6	35
Rivetters	T.	30/6	30 6	29/6	31	32	32	32	30
Strippers	T.	33	33	31 6	32/6	32/6	33/6	33/6	31/6
Chippers	T.	30 6	30 6	29/6	31	32	32	32	30
Caulkers	T.	30/6	30/6	29/6	31	32	32	32	30
Holders-up	T.	24 6	24/6	24 6	25/6	26	26	26	25
Platers' helpers	T.	22	22	21	21	21	21	21	21
Hand-drillers	T.	22	22	21	21	21	21	21	21
Smiths	T.	28, 32	28, 32	26 6, 30 6	28, 6, 30 6	28/6, 32	30, 32	30, 32	29, 32
Strikers	T.	21	20, 21	19, 21	26	21	21, 22	21	21
Carpenters	T.	33	33	30	30	31/6	33	33	31/
Joiners	T.	32	32	30	30	31/6	31/6	31/6	30/
Painters, {brush	T.	29/6	29/6	29/6	29/6	29/6	29/6	29/6	29/
Painters' labourers	T.	31/6	31/6	31/6	31/6	31/6	31/6	31/6	31/
Sailmakers	T.	20	20	20	20, 21	20, 21	20, 21	20, 21	20, 21
Riggers	T.	30	30	30	30	30	30	30	30
Labourers	T.	30	30	30	30	30	30	30	30
Plumbers	T.	19, 21	19, 21	20	20	20	19, 21	19, 21	19, 21
	T.	36	36	34	34	34	36	36	35
Engine shop, &c.—									
Fitters and turners	T.	30	30	28 6	28/6	28/6	30	31	28
Patternmakers	T.	34	34	32	32	34	34	34	32
Moulders	T.	34	34	32	32	34	34	34	32
Smiths	T.	30	30	28/6	28 6	30	29, 32	30, 32	29, 32
Smiths' strikers	T.	21	20, 21	19, 21	20	19, 21	19, 21	19, 21	19, 21
Labourers	T.	18	18	18	18	18	18, 19	18, 19	18, 19
Brassfinishers	T.	—	—	31, 32	31	31	31	31	31
Boiler shops—									
Angle-iron smiths	T.	39	39	36 6	37/6	39	39	39	36
Platers	T.	36	36	34 6	36	37/6	37/6	37/6	35
Rivetters	T.	30/6	30 6	29/6	31	32	32	32	30
Chippers	T.	30/6	30/6	29/6	31	32	32	32	30
Caulkers	T.	30/6	30/6	29/6	31	32	32	32	30
Holders-up	T.	24 6	24 6	24 6	25/6	26	26	26	25
Platers' helpers	T.	22	20	19	19	21	21	21	22
Hand-drillers	T.	22	22	21	21	21	21	21	22

* 30s., 31s. in 1887.

† 34s. in 1886-87.

HULL.

The whole of the auxiliary evidence relating to Hull has been simply confirmatory of the rates given in Tables 10A and 10B, except that the boilermakers reported to the Commission on Trade Depression in December, 1885, that wages were then equal with those of 1865, but that there had been rises of 2s. time and 10 per cent. piece in good times. The reporter seems to have referred in his statement mainly to rivetters and caulkers.

Shipyards. Engine Shops and Boiler Shops, 1876—1905.

1888.	1889.	1890.	1891.	1892.	1893-95.	1896.	1897.	1898.	1899-1904.	1905.
Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.	Z.
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
37/6	39	39	39	38	37	38/6	40	41	41	41
36/6	38	38	38	37	36	37/6	39	40	40	40
31/6	33	33	33	32	31	32/6	34	35	35	35
31/6	33	33	33	32	31	32/6	34	35	35	35
31/6	33	33	33	32	31	32/6	34	35	35	35
31/6	33	33	33	32	31	32/6	34	35	35	35
25/6	27	27	27	26/6	26	27	28/6	29/6	29/6	29/6
21	21	21	21/6	21/6	20/6	21/6	22/6	23/6	23/6	23/6
21	21	22	22/6	24	23/6	24	26	27	27	27
30, 32	30, 32	30, 33	30/6, 33	30/6, 33	28/6, 31	30/6, 33	32/6, 35	33/6, 36	33/6, 36	33/6, 36
21	21	21	22	21/6	21	22	23/4	24	24	24
31/6	33	34/6	34/6	34/6	33/6	35/6	37/6	37/6	38/6	37/6
30/6	31/6	33	33	33	33	35/4	37/6	37/6	38/6	37/6
29/6	29/6	29/6	29/6	29/6	29/6	29/6	29/6	29/6	29/6	29/6
31/6	31/6	31/6	31/6	31/6	31/6	31/6	31/6	31/6	31/6	31/6
20, 22	20, 22	21, 22	22, 22/6	22, 22/6	21, 21/6	22, 22/6	22/6, 23	22/6, 23	22/6, 23	22/6, 23
30	30	30	30	30	30	30	30	31/6	31/6	31/6
30	30	30	30	30	30	30	30	30	30	30
19, 21	19, 21	20, 21	20, 21/6	20, 21/6	20, 20/6	21, 21/6	22, 22/6	22/6, 24	22/6, 24	22/6, 24
35	35	35	35	35	35	35	37/6½	37/6½	39/9†	39/9
31	33	33	33	32	31	33	35	36	36	36
34	36	36	36	35	34	36	38	39	39	39
34	36	36	36	35	34	36	38	39	40	40
31, 32	32, 33	32, 33	32, 33	32, 33	30, 31	32, 33	34, 35	35, 36	35, 36	35, 36
21	21	21, 22	21, 22	21, 22	20, 21	21, 22	23, 24	23, 24	23, 24	23, 24
18, 19	18, 19	19/6	20	20	20	21	22	22/6	22/6	22/6
31	31	31	33	33	32	33	35	36	36	36
37/6	39	39	39	38	37	38/6	40	41	41	41
36/6	38	38	38	37	36	37/6	39	40	40	40
31/6	33	33	33	32	31	32/6	34	35	35	35
31/6	33	33	33	32	31	32/6	34	35	35	35
31/6	33	33	33	32	31	32/6	34	35	35	35
25/6	27	27	27	25/6	26	27	28/6	29/6	29/6	29/6
21	21	21	21, 21/6	21/6	20/6	21/6	22/6	23/6	23/6	23/6
21	21	22	22/6	24	23/6	24	26	27	27	27

† From 1900.

TABLE 10B.—HULL. Comparative Levels of Piecework Rates at the End of each Year. 1878—1905.

	1878.	1879.	1880.	1881-83.	1884.	1885-87.	1888.	1889.	1890-91.	1892.	1893-95.	1896.	1897.	1898-01.	1902.	1903.	1904.	1905.*
Shipyards—																		
Angleiron smiths	100	95	100	105	95	95	100	105	105	97½	95	100	105	107½	100	95	90	85
Platers	100	95	100	105	95	95	100	105	105	97½	95	100	105	107½	100	95	90	85
Riveters	100	95	98†	103	93	85†	93	98	98	90½	88	93	98	100½	100½	95½	93	88
Chippers	100	95	100	105	95	95	100	105	105	97½	95	100	105	107½	107½	102½	100	95
Caulkers	100	95	100	105	95	95	100	105	105	97½	95	100	105	107½	107½	102½	100	95
Smiths	—	—	—	100§	95	95	95	95	105	105	97½	102½	107½	110	110	110	110	110
Hand drillers	—	—	—	—	—	100	105	105	105	100	100	100	105	107½	107½	107½	107½	102½
Mach'nemen	—	—	—	—	—	—	—	—	—	100	92½	100	105	107½	107½	107½	107½	107½
Boiler shops—																		
Angleiron smiths	—	—	—	—	—	—	—	—	100	95	92½	97½	102½	105	105	102½	102½	102½
Platers	—	—	—	—	—	—	—	—	100	95	92½	97½	102½	105	105	102½	102½	102½
Riveters	—	—	—	—	—	—	—	—	100	95	92½	97½	102½	105	105	102½	102½	102½
Chippers	—	—	—	—	—	—	—	—	100	95	92½	97½	102½	105	105	102½	102½	102½
Caulkers	—	—	—	—	—	—	—	—	100	95	92½	97½	102½	105	105	102½	102½	102½
Hand drillers	—	—	—	—	—	—	—	—	100||	90	100	105	110	112½	112½	112½	112½	112½
Machinemen.....	—	—	—	—	—	—	—	—	—	100	92½	100	105	107½	107½	107½	107½	107½

* 30th March.

† General increase 3½ per cent., some special items 5 to 10 per cent., and other rates re-arranged.

‡ On some rates 2½ per cent. lower to 1905.

§ Piecework rates re-arranged March, 1887, on an advance.

|| 1889.

Shipyards' rates were revised in 1898, and shipyard riveters' rates were revised in 1897.

TABLE 11.—DUNDEE. Wages for an Ordinary Week's Work in Engineering, 1855—1903.

Year ..	1855-59.	1860-61.	May, 1867.	1871.	1874.	1874-75.	1876-78.	1877.	1880.	1883.	1884.	1893.	1894.	1896.	1897.	1899.	1903.
Authority	A.	A.	M.	A.	A.	J. a.	J. a.	B.	B.	B.	K.	H.	Z.	Z.	Z.	Z.	Z.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	Num- ber.	s.	s.	s.	s.	s.	s.	s.
Skilled workmen.....	22	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ironmoulders	—	—	28 to 31	30	31	28 to 30	28 to 30	31	30	34 1/4	34 1/2	33 & 34	33 & 35	—	36 & 38	38 & 40	37 & 39
Joiners	—	—	—	—	—	—	—	27	28	1 1/2	27 1/2	26	—	—	—	—	—
Patternmakers	—	—	24, 25	24	27	28 to 32	27 1/2 to 30	27 1/2	29	1 1/2	30 1/2	29 & 31	31 & 33	—	33	35 to 37	34 to 36
Smiths	—	—	23 to 27	23 1/2	26 1/2	26 to 28	26 to 28	28 1/2	27	3 1/2	30	31	29 to 32	28, 34	34	31 to 35	30 to 34
Strikers	—	—	16, 17	16	19 1/2	—	—	19 1/2	19	3 1/2	20	20	18, 20	19, 21	21	—	—
Engineers	—	—	—	23	28 1/2	—	—	—	—	—	—	—	—	—	—	32 to 35	31 to 34
Fitters	—	—	23 to 27	23	28 1/2	24 to 26	24 to 26	25 1/2	26	9 1/2	29 1/2	28	24 to 28	26 to 30	32	—	—
Erectors	—	—	23 to 27	24 1/2	28 1/2	26, 27	26, 27	27 1/2	28	4 1/2	30	29	26 to 30	28 to 32	32	—	—
Turners	—	—	15 to 26	—	—	28 to 32	28 to 32	—	—	1 1/2	26 to 29	28 to 31	27	29	30	—	—
Millwrights	—	—	—	—	—	—	—	—	—	—	—	—	29 to 31	31 to 33	28	—	—
Planers	—	—	18 to 23	22 1/2	23	—	—	24	25	1 1/2	26 1/2	23	24, 25	26, 27	20	—	—
Sloters	—	—	16 to 20	22	24	—	—	24	25	—	21 1/2	26 1/2	21, 23	23, 25	28 & 29 1/2	—	—
Shapers	—	—	15 to 26	16	21 1/2	—	—	—	—	—	21 1/2	26 1/2	19	20	20 to 30	—	—
Boreis	—	—	—	16	21	—	—	—	—	—	—	—	18 to 22	19, 23	27 & 28	—	—
Screwers	—	—	—	16	21	—	—	—	—	—	—	—	22	23	26 & 29	—	—
Drillers	—	—	—	—	—	—	—	20 1/2	18	—	19 1/2	22	18 to 22	19, 23	27 & 28	—	—
Machinemen	—	—	—	—	—	—	—	22 1/2	22	—	22 1/2	24 1/2	24 1/2	25	26 & 29	—	—
Finishers	—	—	—	—	—	—	—	27 1/2	24	—	29 1/2	—	—	—	20 to 27	—	—
White smiths	—	—	22 1/2	30	—	—	—	—	—	—	—	—	—	—	—	—	—
Brassmoulders	—	—	—	—	—	—	—	28	28	0 1/2	34 1/2	33	35, 36	—	—	—	—
Coppersmiths	—	—	—	—	—	24, 26	26, 28	—	—	—	34	33	29	—	34	—	—
Dressers	—	—	—	—	—	28, 29	28, 29	28 1/2	—	—	32	34	30	—	32 & 33	—	—
Foundry labourers ..	—	—	—	—	—	—	—	17	17	3 1/2	20	19	15 to 18 1/2	19	19	—	—
Labourers	—	—	—	—	—	—	—	17 1/2	16	28 1/2	16 1/2	18	15 to 20	18	18	—	—
Bolt-makers*	—	—	—	15	18	16 to 19	16 to 19	17 1/2	16	28 1/2	16 1/2	18	15 to 20	18	18	—	—
Angle-iron smiths ..	—	—	—	23 1/2	28	27 to 29	27 to 29	27 1/2	27	5 1/2	35	—	—	—	—	—	—
Platers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riveters	—	—	—	—	—	—	—	—	—	—	35 1/2	—	32	—	—	37 & 38	—
Holder-up	—	—	—	—	—	—	—	—	—	—	33	34	34	—	36 1/2	36 1/2	—
	—	—	—	20	—	—	—	20	18	0 1/2	19 1/2	20 1/2	19 & 20	—	18 & 22 1/2	—	—

J. a. The dollar has been converted into pounds sterling at 4s. per dollar, not 4s. 2d. as in other cases in these articles.
 * In shipbuilding, 1866, 27s.; 1867-68, 23s. to 25s.; 1871 and 1874, 30s.

TABLE 12.—DUNDEE. *Wages for an Ordinary*

Year	—	55-56.	57-58.	58.	59-60.	61.	63.	1866.	1867-78.	1871.	1874.	74.	1874.	1875.		
Authority	—	E.	E.	E.	E.	E.	E.	E.	D.	D.	E.	D.	J a.	J a.		
	Time or Piecework.							Number.	Wage.	Number.	Wage.					
		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.		
Shipwrights	T.	26	22	16 ⁷	18	18	20	26	24, 26	9	20, 21	24	29 9	30 6	29, 30	29, 30
Shipjoiners	T.	20	20	18	19	18	19	6	23	12	21, 24	26	28	29	28, 30	28, 30
Shipsmiths	T.	20	20	18	18	20	20	3	24, 30	4	20, 21	28	27	27 6	24, 26	24, 26
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shipsmiths' strikers	T.	—	—	—	—	—	—	10	16	4	16	16	20	19 6	18, 20	18, 20
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sawyers	—	—	—	—	—	—	—	2	24	2	21	26	29 9	24	—	—
Sawmillers	—	—	—	—	—	—	—	—	—	—	—	—	24	—	—	—
Angle-smiths	T.	—	—	—	—	—	—	3	28	2	26	28 { 24 ² (34) }	29 6	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Platers	T.	—	—	—	—	—	—	4	27	3	23, 25	28	30	29 6	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rivetters	T.	—	—	—	—	—	—	7	23	9	21	25	28	28	28, 34	28, 34
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caulkers	T.	—	—	—	—	—	—	—	—	—	—	24, 26	—	28	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chippers	T.	—	—	—	—	—	—	—	—	—	—	21	—	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holders-up	T.	—	—	—	—	—	—	4	15	8	15	—	20	—	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drillers	T.	—	—	—	—	—	—	—	—	—	—	18	—	19	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Helpers	T.	—	—	—	—	—	—	—	—	—	—	16	—	16	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	T.	—	—	—	—	—	—	9	13, 15	23	13, 11	14	17	16	—	—
	P.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Engineers	—	—	—	—	—	—	—	—	—	—	—	28	—	25	—	—
Painters	—	—	—	—	—	—	—	—	—	—	—	28	—	29 9	—	—
Sailmakers*	—	—	19 { 18 19 }	18	18	6 18	6	—	21	—	21	—	—	27	21, 23	23, 25
Blockmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22 6 23 6	22 6 23 6
Cabinet-makers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Moulders	—	—	—	—	—	—	—	—	—	—	—	30	—	—	—	—
Boiler-makers	—	—	—	—	—	—	—	27	—	23, 25	30	30	30	—	—	—

* 19s. in 1855, 20s. in 1856. *Returns*, pp. 267—269.

† Helpers assisting platers who are pieceworkers.

‡ Rose from 21s. 9d. to 26s. in 1896.

DUNDEE.

We have practically no additional evidence relating to Dundee other than for smiths, except that in 1864 the hours were reduced from 58½ to 57 without a reduction in wages, and that the engineers in 1888 struck successfully for restitution of 1s. reduction taken

Week's Work in Shipbuilding, 1855—1904.

1876.	1877.	1878.	1877.		80.	1883.		1884.	1893.	May, 1898.	'93 95.	1896.	1897.	'98 1902.	1903.	'04.
J a.	J a.	J a.	D.		D.	D.		K.	II.	Z.	Y.	Y.	Y.	Y.	Y.	Y.
			Number.	Wage.		Number.	Wage.									
s.	s.	s.		s.	s.		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
29, 30	29, 30	29, 30	7-6	27 8	27	11-1	33, 9 { 31 6 } 33	32 11 1/2	36	32 7 1/2	34 10 1/2	36	37 1 1/2	36	36	36
28, 30	28, 30	28, 30	7-0	31	27 6	7-4	31 6	29, 31	31 6	36	32 7 1/2	34 10 1/2	36	37 1 1/2	36	36
26, 28	26, 28	26, 28	6-3	27	28	2-9	30	28 3, 30	35 2 { 23 to } 37 6 }	29	31	32	33	32	—	—
—	—	—	—	—	—	—	70	—	—	—	—	—	—	—	—	—
18, 20	18, 20	18, 20	5-6	20	19 6	2-9	21	18 9, 20	20 6	21 6	20 3	21 3	—	22 6	—	—
—	—	—	—	—	—	—	26	—	—	—	—	—	—	—	—	—
—	—	—	0-7	21	25	0-1	26	— { 15 6 } 17 6 }	—	—	—	—	—	—	—	—
—	—	—	—	—	32	0-5	36	—	35	39 4 1/2	36	37 1 1/2	—	—	—	—
—	—	—	—	—	50	—	80	—	—	—	—	—	—	—	—	—
—	—	—	5-6	29	30	5-2	34	—	32 11 1/2	34 10 1/2	36	37 1 1/2	—	—	—	—
—	—	—	—	42	45	—	70	74	—	—	—	—	—	—	—	—
28, 31	28, 31	28, 31	7-6	28	28	12-3	32	—	31 6	33 9	—	34 10 1/2	37 1 1/2	—	—	—
—	—	—	—	35	36	—	60	51 3	—	—	—	—	—	—	—	—
—	—	—	2-0	28	28	—	32	—	31 6	33 9	34	35 1 1/2	—	—	—	—
—	—	—	—	35	34	—	33	39 6	—	—	—	—	—	—	—	—
—	—	—	—	28	28	—	35	—	31 6	33 9	—	—	—	—	—	—
—	—	—	—	34	34	—	55	—	—	—	—	—	—	—	—	—
—	—	—	—	20	20	5-6	23	—	22	24 3	—	—	—	—	—	—
—	—	—	5-2	24	27	—	45	38 6	—	—	—	—	—	—	—	—
—	—	—	1-3	20	20	2-3	23	—	21	—	—	+ 1	+ 1	—1 1 1/2 §	—	—
—	—	—	—	32	25	—	30	26 6	—	—	—	—	—	—	—	—
—	—	—	—	16	13 5	—	16	—	15 6	—	—	—	—	—	—	—
—	—	—	—	24	26	—	26	—	—	29 3 1/2	24 9 1/2	27 9	29 3	31 6	30 4 1/2	29 3
—	—	—	23-5	16	16	10-2	17	17, 17 6	15 6	15 6	—	—	—	—	—	—
—	—	—	—	24	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	0-7	26	25	0-7	29	—	28	32	27	29	30	31	31	30
—	—	—	1-8	26	29 3	4-6	29 9 { 29 3 } 31 6 }	32 11 1/2	36	32 7 1/2	33 9	34 10 1/2	36	—	—	—
23	23	23	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25	25	25	—	27	25	—	25	—	—	—	—	27	28	—	—	—
20	20	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24	24	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	31 6	36	—	34 10 1/2	36	38 3	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	36	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

§ In 1902.

J a. The dollar has been converted into pounds sterling at 4s. per dollar, not 4s. 2d. as in other cases in these articles.

in 1886. The associated smiths report reductions of 4s. to 5s. in 1884, within a space of six or nine months, and that in 1889 full restitution had not yet been made. Subsequent to this we have accounts of increases of 2s. 6d. in 1888, 2s. in 1889, and 1s. in January, 1890, and reductions of 1s. in 1892, and 1s. either late in 1892 or early in 1893.

TABLE 13.—BELFAST. *Wages in an ordinary Week*

Year	1855-56.	1857.	1860-61.	1884.	1886.	1886.		1888.	Dec.'90.
Authority	A.	A.	A.	Z.	Z.	F.		Z.	L.
						Number.	Wage.		
	s.	s.	s.	s.	s.		s. d.	s.	s.
Foundries and engine shops—									
Patternmakers	—	—	—	32	29	28	29 1	32	34
Ironmoulders	30	30	30, 33	33, 34	31, 33	88	29 10	34	34
Coremakers	—	—	—	—	—	7	19 5	—	—
Dressers	—	—	—	—	—	47	13 8	—	—
Foundry labourers	—	—	—	16	15 6	—	—	16	16
Brassmoulders	—	24, 28	24, 28	32	30	7	27 7	33	34
Fitters and erecters	26	28	27, 30	31	28, 29	174	27 1	31	33
Millwrights	26	28	27, 30	—	—	—	—	—	—
Turners	26	28	—	31	29	84	27 1	32	34
Planers	—	—	—	20	—	} 29	16 11	{	27
Shapers	—	—	—	20	—		—		—
Slotters	—	—	—	20	23		15 6		—
Borers	—	—	—	—	—	12	16 10	—	—
Drillers	—	—	—	17, 23	—	} 53	15 4	{	—
Serewers	—	—	—	19	—		—		—
Brassfinishers	—	—	—	29	28		—		—
Coppersmiths	—	—	—	—	—	—	—	—	—
Smiths	26	27	27, 33	31	27	17	26 10	31 6	35
Smiths' strikers	—	—	—	16	17	25	14 11	17 6	19
Joiners	—	—	—	—	—	14	23 10†	—	33/9
Grinders	—	—	—	20	16	12	17 4	—	—
Labourers	—	—	—	15	14 6	222	13 -	14 6	15
Boilermaking	26	27	27, 33	—	—	—	—	—	—
Angle-iron smiths	—	—	—	27	—	—	—	27/6	30
Angle-iron smiths' strikers	—	—	—	16	16	—	—	16	15/6
Platers	—	—	—	38	34	—	—	37/6	41/6
Rivetters	—	—	—	33	28	—	—	32	36
Caulkers	—	—	—	33	28	—	—	32	—
Holders-up	—	—	—	—	—	—	—	22 6	25/6
Helpers	—	—	—	—	—	—	—	—	15/6
Hand drillers	—	—	—	21	—	—	—	—	20
Labourers	—	—	—	15	14 6	—	—	15	—

(a.) The majority rates given in Z., 1894, carried forward on the assumption that they changed with the standard rates.

for Time Workers in Engineering. 1855—1904.

Aug., 1892.		1893.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	'99-1902.	1903-04.
HH.		II.	(a).	(a).	Z.	(a).	(a).	(a).	(a).	(a).	(a).
Number.	Wage.										
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
43	34	33	34	33	33	33	37	38	39	39	39
135	34	33, 35	33, 35	32, 34	32, 34	32, 34	36	37	38	38	38
—	—	20	—	—	11—20 6	—	—	—	—	—	—
185	—	17	—	16 6	16 6	16 6	17 6	18 6	19	—	—
40	34	34	34	32	32	32	34	37	38	38	38
364	34	33	33	32	32	32	35	36	37	37	36
—	—	33	33, 34, 9	32, 33, 9	32, 33, 9	32, 33, 9	35, 36, 9	36, 37, 9	37, 38, 9	37, 38, 9	36, 37, 9
120	35	34	34	33	33	33	36	37	38	38	37
129	—	26	34	33	33	33	35	36	37	37	36
	—	—	27, 34	26, 33	26, 33	26, 33	28, 35	29, 36	30, 37	30, 37	29, 36
	—	25	27, 34	26, 33	26, 33	26, 33	28, 35	29, 36	30, 37	30, 37	29, 36
	—	—	15 6 and upwards	14 6 and upwards	14 6 and upwards	14 6 and upwards	16 6 and upwards	17 6 and upwards	18 6 and upwards	18 6 and upwards	17 6 and upwards
	—	22	15—18	14—17	14—17	14—17	16—19	17—20	18—21	18—21	17—20
—	34	34	34	32	32	32	35	36	37	37	36
—	35	—	30, 33	29, 32	29, 32	29, 32	32, 35	33, 36	34, 37	34, 37	33, 36
33	33	34	31, 33	30, 32	30, 32	30, 32	33, 35	34, 36	35, 37	35, 37	34, 36
61	—	19	—	17, 19	17, 19	—	2 +	+ 6d.	+ 6d.	*	—
43	—	33, 9	—	—	—	—	—	—	—	—	—
553	—	—	—	—	18 6, 19 6	—	—	—	—	—	—
—	—	—	—	—	15 6	15 6	16 6	17 6	18	18 6	18 6
7	—	38 6	39, 43	38, 42	38, 42	38, 42	40, 44	41, 45	42, 46	43, 47	42, 46
7	—	17	—	—	18	—	—	—	—	—	—
52	39	38 6	37, 6, 39 6	36 6, 38 6	36 6, 38 6	36 6, 38 6	38 6, 40 6	39 6, 41 6	40 6, 42 6	41 6, 43 6	40 6, 42 6
139	—	33	34	33	33	33	35	36	37	38	37
—	—	33	34	33	33	33	35	36	37	38	38
—	—	24 6	25, 25 6	24, 24 6	24, 24 6	24, 24 6	26, 26 6	27, 27 6	28, 28 6	29, 29 6	28, 28 6
417†	—	15	—	—	15 6	15 6	16 6	17 6	18	—	—
—	—	—	—	—	20	—	—	—	—	—	—
—	—	15	—	—	14, 16	14, 16	15, 17	16, 18	16 6 18 6	—	—

* 1899, 53 rose from 20/6 to 22/-.

† The joiners in the wage census were mainly engaged in a rough class of work.

‡ Includes rivet boys, labourers, and probably holders-up.

TABLE 14.—BELFAST. *Time Wages in a*

Year	'60,61.	1866.		1866.		1871.	1874.	1874.	1877.	1883.		1884.		
Authority	D.	D.		E.		D.	E.		I.	D.	D.		Z.	
		Number.	Wage.	Number.	Wage.		Number.	Wage.		Number.	Wage.			
	s.		s.		s.			s.		s.		s.		
Shipwrights†	24	7.3	30	50	33	28	9	32, 33	32.3	4.1	31	4	33	32
Shipjoiners	23	5.6	25, 30	8	30	27	16	23, 33	27.6	6.3	30	12	30.6	30
Sawyers	—	0.9	22	8	22	24	1	20, 29	23	0.8	24	2	29	—
Sawmillers.....	—	—	—	—	—	—	—	—	—	0.2	25	1	25.6	—
Smiths	24	3.7	21, 34	6	26	24, 27	6	19, 35	26.6	2.4	29	2	27	25
Strikers	—	3.9	12, 14	6	13	14	7	12, 15	14.6	4.2	18	3	16.6	16.6
Angle smiths	—	—	—	—	—	27	—	30, 32	—	0.1	30	1	30	33.6
Angle smiths' } strikers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Platers	27	4.2	21, 32	—	—	27	2	28, 34	—	2.1	29	2	36	34
Riveters	22	14.5	21, 25	—	—	25	7	27, 30	—	11.2	28	11	34.6	30
Chippers and } caulkers.....	19	5.5	15, 23	—	—	—	6	23, 27	—	6.3	24	3	30	29
Holders-up	—	—	—	—	—	16	5	17, 19	16	5.1	18	5	23.6	22
Drillers	—	2.1	6, 74	—	—	—	—	—	—	0.9	20	2	14	14
Helpers {time ...	—	25.7	11.6, 13.6	—	—	14	—	—	—	14.0	14	8	17	15
Helpers {piece ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	11	12.9	12, 14	—	—	13	27	13, 15	15.6	13.3	14	10	14.6	14
Patternmakers.....	—	—	—	—	—	—	—	—	28.9	0.3	29	2	29	—
Fitters	—	1.5	24, 27	—	—	—	—	—	28.9	2.3	28	2	28	29
Riggers	—	0.4	22	—	—	—	—	—	27.3	0.4	26	1	27.6	—
Painters	—	2.1	24, 28	—	—	—	—	—	29.3	3.1	30	5	30	—
Sailmakers.....	—	—	—	—	—	27, 32	—	30	—	—	—	—	—	—
Gasfitters	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Plumbers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scrapers and red- } leaders	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fitters' helpers ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(a.) The majority rates given in Z., 1894, carried forward on the assumption that they changed with the Standard Rates.

* Wages paid and numbers employed, September, 1892, by one large firm. A general reduction took place at the end of 1892.

† In wood ships, 1855, 27s.; 1856, 30s.; 1860-61, 27s. The return for 1894 gives 34s. 6d., but this apparently is a misprint, 33s. 6d. is taken as the basis of comparison.

BELFAST.

With regard to Belfast the additional evidence is not large, but with regard to the period 1886-93 it is important. The engineers report that mill mechanics were threatened with a 10 per cent. reduction in 1874, but that was averted by strike. In 1879 there was another strike, this time against a reduction of 3s. in mills and 2s. in shops. This strike was lost. Trade had been bad since 1875. In 1888 the engineers and patternmakers obtained rises of 2s., and late in the year an increase of 1s. "all round" is reported. In 1891 they struck for a rise similar to that obtained by the patternmakers and smiths. A rise of 1s. was accepted. In 1892 there were reductions all round, applying to the shipyards as well as the engine shops. Some of these we can trace, namely, patternmakers, engineers, smiths, and ironmoulders, 1s.; shipjoiners, 1s. 1½d.; brassfinishers (some), 2s.; boilermakers, either 1s. 6d. or 2s. (apparently the latter), and the general notice, of which we have not been able to find a copy, seems to have been of a reduction to equal the last

Full Week in Shipbuilding. 1860—1904.

'86.	'88.	Dec. '90.	Aug., 1892.		'93.	Dec., 1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899-1902.	1903-04.
Z.	Z.	L.	H II.*		II.	(a.)	(a.)	Z.	(a.)	(a.)	(a.)	(a.)	(a.)	(a.)
			Number.	Wage.										
s.	s.	s.		s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
29	31/6	35	346	35	33/6	35	33/6	33/6	33/6	35/9	37/1½	38/3	38/3	37/1½
28	30/6	33/9	340	33/9	33/9	32/7½	33/9	33/9	33/9	36	37/1½	38/3	38/3	37/1½
—	—	26/6	12	26/6	26/6	—	—	27, 28	27, 28	27, 28	29, 30	30, 1½, 31/1½	30/1½, 31/1½	29, 30
—	—	—	—	—	26	—	—	—	—	—	—	+ 1/1½	—	— 1/1½
23/3	26/6	31/6	78	—	32	28—33	27—32	27—32	27—32	29—34	30—35	32—37	32—37	32—36
15/6	17/6	19/6	117	—	19/6	—	—	17/6, 19/6	17/6, 19/6	18, 6, 20/6	19, 21	19, 6, 21/6	19/6, 21/6	19, 21
29	33	37	—	—	34	35	34	34	34	36	37	38	39	39
—	—	19/6	—	—	19/6	—	—	18	18	19	19/6	20	20/6	20
29	33	37	229	37	34	35	34	34	34	36	37	38	39	39
26	30	34	400	34	31	32	31	31	31	33	34	35	36	36
23	30	34	129	—	31	32	31	31	31	33	34	35	36	36
20	23	26	177	—	25	25, 26	24, 25	24, 25	24, 25	26, 27	27, 28	28, 29	29, 30	29, 30
13/6	14/6	15/6	189	—	15/6	—	—	15/6	—	—	20	21	—	—
14	16	17	816	—	17	—	—	16	—	—	—	—	—	—
14/6	15	15	486	15½	16	—	26 1½	26 4	—	+ 10%	+ 2½%	+ 2½%	+ 2½%	— 2½%
—	—	—	—	—	—	—	—	15/6, 16	15/6, 16	16/6, 17	17/6, 18	18, 18/6	18/6, 19	18/6, 19
27	29	33	114	—	34	34	33	33	33	37	38	39	39	39
—	—	29	27	29/6	29/6	—	—	29/6	—	—	30	31	32	32
—	—	32	42	32	32	32	32	33/9	33/9	36	36	36	36	36
—	—	30	13	31	31	—	—	31	31	31	32	32	32	32
—	—	—	72	33	—	—	—	—	—	—	—	—	—	—
—	—	—	—	36	36	36	36	36	36	36	38/3	38/3	38/3	38/3
—	—	—	154	—	18	—	15 10½	16	—	—	17/6	—	—	—
—	—	15/6	107	—	16	—	—	—	—	—	—	—	—	—

‡ Boys.

§ 1904.

|| Range 12s. to 17s., average 15s.

¶ 1867-68, 27s.

advance. The associated smiths, who chiefly work in shipyards, report rises of 1s. time and 5 per cent. piece in December, 1888; 1s. to 1s. 6d. in February, 1889 (being 2s. 6d. and 3s. since May, 1888, this being apparently the date of the first rise after the depression of 1884-86); 1s. and 5 per cent. in June and August, 1889; 1s. 1½d. and 2½ per cent. in February, 1890. Altogether the increases between 1888 and 1890 seem to have been 5s. time and at least 17½ per cent. piece. The boilermakers and iron shipbuilders report in 1885 that they had suffered reductions of 6s. 6d. on time wages within twelve months. The subsequent course of the wages of those workers may be seen in Part A,⁵ the time rates there given, taken for 1882 to 1890 from the books of an employer, being identical with the trade union statements. This similarity of statements of employers and trade unions applies practically to all skilled workers in engine shops and shipyards at Belfast.

⁵ *Journal of the Royal Statistical Society*, March, 1905, pp. 130 and 131.

TABLE 15.—LIVERPOOL and BIRKENHEAD.—Time Rates of

Year	'55.	'56.	'57.	'58.	'59.	'60.	'61.	'62.	'71.	'72.	'72.	'73.	'73.	'73.
Place*.....	L.	L.	L.	L.	L.	L.	L.	L.	B.	B.	B.	B.	L or B.	L or B.
Authority	A.	A.	A.	A.	A.	A.	A.	A.	V.	I.	V.	V.	I.	I.
Engine shops and foundries—	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Patternmakers ...	28, 30	28, 30	28, 30	28, 30	28	28, 30	28, 30	28, 30	31	34, 36	33	36	35	34/4
Ironmoulders, sand	32	33	34	30	30	31	31	30/3	34	—	34	36	—	36
„ loam	36	36	36	36	30	36	36	36	—	—	—	—	—	40
Dressers.....	21	20	20	19	19	19	19	19	24	—	24	26	—	26
Coremakers	—	—	—	—	—	—	—	—	—	—	—	—	—	31
Foundry labourers	18	18	18	18	18	21	21	21	—	—	—	—	20	22
Brassmoulders	—	—	—	—	—	—	—	—	—	—	—	—	—	42
Brassfinishers	—	—	—	—	—	—	—	—	—	—	—	—	—	32
Fitters	30	30	30	29	29	29	29	30/3	29	—	30	33	32/6	31/6
Erectors	30	29	29	29	29	29	29	28/6	—	—	—	—	—	—
Turners	—	—	—	—	—	—	—	—	30	30, 32	31	34	33	34/6
Millwrights	30	30	30	29	29	29	29	28/6	—	—	—	—	—	—
Planers	—	—	—	—	—	—	—	—	24	—	25	28	28	31
Slotters	—	—	—	—	—	—	—	—	21	—	25	28	28	30
Shapers	—	—	—	—	—	—	—	—	—	—	—	—	28	28
Borers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drillers, machine...	—	—	—	—	—	—	—	—	20	—	21	23	24/7	25
„ hand	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Screwers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grinders	—	—	—	—	—	—	—	—	—	—	—	—	31/3	35
Smiths	32	32	32	32	32	32	32	32	31	—	32	35	34/4	34/4
Strikers	—	—	—	—	—	—	—	—	19	—	20	22	22/6	22/9
Joiners	—	—	—	—	—	—	—	—	30†	—	31†	34†	33	34/4
Painters	—	—	—	—	—	—	—	—	29†	—	29†	32†	—	—
Coppersmiths	—	—	—	—	—	—	—	—	32	—	33	36	—	—
Plumbers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Whitesmiths	24, 26	24, 26	24, 26	24, 26	24	24, 26	24, 26	23/6, 26	—	—	—	—	—	—
Labourers	18	18	18	18	18	18	18	17/6	18	18, 23	18	20	19	18
Boiler shops—														
Boilermakers	28	28	28	28	28	28	28	27/6	—	—	—	—	—	—
Angle smiths	—	—	—	—	—	—	—	—	—	—	—	—	37	38
Platers, heavy	—	—	—	—	—	—	—	—	34	—	34	36	34/4	36
„ light	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riveters	—	—	—	—	—	—	—	—	28	34, 36	30	32	32	31
Caulkers.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holders-up	—	—	—	—	—	—	—	—	24	—	24	26	32	26
Labourers	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Angle iron smith's strikers	—	—	—	—	—	—	—	—	—	—	—	—	22	—

* L = Liverpool. B = Birkenhead.

(a). The return for 1893, II, carried forward on the assumption that these rates changed with the changes in Standard rates.

Wages for an Ordinary Week's Work in Engineering, 1855—1904.

'73.	'73.	'73.	'76.	'84.	'84.	'86.	'86.	'88.	'90.	'93.	'94.	'97.	'92.	'93-95.	'96.	'97.	'98.	'99-04.
L. or B.	L. or B.	L. and B.	B.	L.	L. and B.	L. and B.	B.	L. and B.	B.	L.	L. and B.	L. and B.	L. and B.	L. and B.	L. and B.	L. and B.	L. and B.	L. and B.
I.	I.	I.	V.	K.	Z.	Z.	L.	Z.	L.	II.	Z.	Z.	(a).	(a).	(a).	(a).	(a).	(a).
s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
34	33/6	34/2	—	33/9	33	30	31	32/6	37	35	35	37	36	35	37	37	38/6	39/6
36	36	36	—	—	34	32	—	34	—	36	36	38	—	36	38	38	39	40
39	39	39/4	—	—	36	34	—	36	—	38	38	40	—	38	40	40	41	42
26	26	26	—	26	—	—	—	—	—	26	26	27	—	26	26	27	—	—
29	30/3	30/1	—	—	—	—	—	—	—	—	—	—	—	—	—	34	35	36
22	19/5	20/10	—	22	19	19	—	20	—	21	20, 21	21	—	—	—	—	—	—
36/6	33/1	37/6	—	—	30	29	—	—	—	—	34	34&36	—	34	36	36	37	38
31/6	32/6	32	—	33	30	29	—	30	—	32	32	34	33	32	34	34	35	36
31/6	32/3	32	33	{ 31, 33 }	{ 30, 31 }	31	30	35/6	33	33	33	34	34	33	34	34	35/6	36
34	33/7	33/8	—	34	31	30	—	30	—	33	33	34	34	33	34	34	35/6	36
32	32	32	—	—	30	30	—	31	—	33	33, 35	—	34	33	34	34	35/6	36
31	27	29/4	—	24	30	28	—	28	—	27	30to34	32	28	27	28	28	29/6	30
28	25	27/9	—	25	30	26	—	28	—	27	30	25	28	27	28	28	29/6	30
—	26/2	27/4	—	—	30	26	—	27	—	27	25to30	—	28	27	28	28	29/6	30
—	—	—	—	—	27	26	—	30	—	27	23	—	28	27	28	28	29/6	30
24	24/6	24/6	—	22 { 22, 19 }	21 { 21, 18 }	21 { 23, 19 }	21 { 22/6 }	22/6	22, 23	22	22to26	23	—	—	—	—	—	—
—	—	—	—	24	21	20	—	21	—	21	20to23	23	—	—	—	—	—	—
31	29/3	31/7	—	34	30	28	—	30	—	—	20 up	—	—	—	—	—	—	—
35	32/4	34	—	33	32	30	—	33	—	34, 35	34, 36	36	36	35	36	36	37/6	38
21	21/5	22	—	22	21	20	21	21	22/6	22	21to24	21, 22	—	—	—	—	—	—
31	30/3	32/2	—	34	—	—	—	—	—	35	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	{ 33 s, 31 w }	—	—	—	—	—	—	—	—
—	33/6	33/6	—	—	—	—	—	—	—	33	32to35	—	34	33	34	34	35/6	36
—	—	—	—	—	—	—	—	—	—	36	—	—	—	—	—	—	+ 2s.	—
19	19/4	18/10	—	20	18	17	18	18	20	23(333)	18to20	19, 22	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	1898	—	—	—	—	—	—	—
35	35/3	36	37	39	38	35	35	38/6	40	37/6	39/6	42/6	39/6	37/6	39/6	40/6	42	42
38	35/1	34/10	36/6	39	36	34	35/6	37/6	40 { 37/6 }	37/6 { 37/6 to 39/6 }	35/6 to 37/6 }	40/6 { 37/6 }	39/6 { 37/6 }	37/6	37/6	38/6	40	40
32	31	31/6	—	34	32	30	30	33/6	37	34	34	36/6	35	34	35/6	36/6	38	38
26	25	27/3	—	28	26	24	24	27/6	30/6	34	—	36/6	35	34	35/6	36/6	38	38
—	—	19	—	20	18	18	—	18	—	19	19	30/6	—	—	29/6	30/6	32	32
—	—	22	—	—	20	19	22	19	22/6	21	21	—	—	—	—	—	—	—

† These might be ship workers.

TABLE 16. — LIVERPOOL AND BIRKENHEAD. *Wages for an Ordinary Week's Work in Shipbuilding, 1855—1896.*

Year	1855-56, 1859,	1858-59,	1860-62,	1859,	1860-61,	1862,	1872,	1873,	1874,	1878,	1880,	1884,	1884,	1886,	1886,	1888,	1890,	1893,	1894,	1896,
Place*	L.	L.	L.	L.	L.	L.	B.	B.	B.	L.	L.	L.	L.	B.	L.	L. and B.	B.	L.	L. and B.	L. and B.
Authority	E.	E.	E.	D.	D.	D.	V.	V.	V.	J.	D.	K.	Z.	Z.	L.	Z.	L.	H.	Z.	Z.
Shipwrights	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Shipwrights	42	39	36	36	36	36	42	42	42	42	36	37/6	36	36	37/6	36	39/9	37/6	{ 37/6 39 }	{ 37/6 39 }
Shipsmiths	33	31/6	31/6	22?	22?	32/3	—	—	—	—	34	35	36	32	33/6	33	38	32	30/6	30/6
Strikers	21	22	22	22	22	17/9	—	—	—	—	22	21	21	22	22	22	22/6	22	20/6	20/6
Sawyers	30	27	27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	{ 28/6 32/6 }	{ 28/6 32/6 }
Joiners	36	30†	33	26 10½	26 10½	29/6	—	—	—	39	34/6	35/2	31	30/6	31	30/6	36/6	36	{ 35 36 }	{ 35 36 }
Painters	—	—	—	—	—	—	—	—	—	{ w 31/8 s 33/6 }	32	32	—	—	—	—	—	{ w 31/8 s 33/6 }	33, 34	—
Boilermakers	—	—	—	—	—	—	—	—	—	—	—	31	—	—	—	—	—	—	—	+ 1
Engineers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fitters †	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Anglo-Iron smiths ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Placers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riveters	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caulkers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holders up	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drillers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sailmakers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Riggers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sawmillen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mast and block makers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Angle-iron smiths ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strikers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Helpers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Boilermakers' helpers ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Labourers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* L. = Liverpool; B. = Birkenhead.

† 23s. is also given in 1859.

‡ These do not seem to be engineers.

§ From pp. 261 and 262 of the *Reveries of Wages*.

LIVERPOOL AND BIRKENHEAD.

[1] Edward Young quotes Mr. Laird, of Laird Brothers, Birkenhead, as informing him that in 1872 the advance in rates of wages over those paid in 1867 was 10 per cent. on the higher and 15 per cent. on the lower rates. In that year the engineers had a strike, after which one firm gave 2*s.* 6*d.* to all above 30*s.* and 6*d.* more in January, 1873, and 1*s.* 6*d.* to all under 29*s.* Another firm offered 2*s.* to all who had not received advances within the previous twelve months. A later report referring to this strike says the engineers received a rise of 2*s.* as the result of it. In 1879 the reduction accepted by the moulders, boilermakers, engineers, steam engine-makers, moulders, patternmakers and planers was

	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>d.</i>		<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>d.</i>
On wages from 24 to 28....			1	6	On wages from 33 to 36....			2	6
„ 29 „ 32....			2	-	„ 37 „ 42....			3	-

In 1881 the boilermakers report an increase, and in 1885 they say that they have already submitted to 22½ per cent. reduction, and are now asked for 15 per cent. more.

In 1882 two rises of 1*s.* for engineers took place, in 1886 reductions were notified; in 1888 increases amounting to 3*s.* 6*d.* for boilermakers were given, and in 1889 there were advances all round.

The Liverpool engineers reported to the Commission on Trade Depression, 1885, that wages in 1865 and 1885 were equal, with rises and reductions of 7½ per cent. in between. The Liverpool boilermakers and iron shipbuilders reported that piecework was about 15 per cent. less and timework 2*s.* per week less in 1885 than they had been twenty years before. The Birkenhead ironfounders reported that wages were the same as twenty years ago. The Liverpool ironfounders say they had risen 2*s.*

TABLE 17.—BARROW. *Time Rates of Wages for an Ordinary Week's Work in Engineering, 1884-1904.*

Year	1884.	1886.	1888.	1890.	1893.	1894.	1897.	1899.	1899.	1899.	1903-04.
Authority	Z.	L.	Z.	L.	H.	Z.	Z.	(a).	(a).	(a).	(a).
Foundries and engine shops—											
Patternmakers	34	32	34	34	33 6	32 6	34	35	35 6	35 6	37 3
Ironmoulders, sand ..	32	30	34	34	34	34 6	36	34	35	35 6	38
Ironmoulders, iron ..	35	33	36	36	34 6	34 6	36	34	35	35 6	38
Dressers	18	18	18	18	18	18 6	19 to 27	19	19	19	19
Foundry labourers ..	36	34	36 6	36 6	36 6	36 6	36	36	36 6	36 6	38
Brassfounders	31	30	31 6	31 6	32	32 6	33	33 6	33 6	33 6	35
Fitters	30	29 6	31	31	31 6	31 6	33	33 6	33 6	33 6	35
Erectors	30	29 6	31	31	31 6	31 6	33	33 6	33 6	33 6	35
Turners	31	30 6	32 6	32 6	32 6	32 6	35	35 6	35 6	35 6	37
Millwrights	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Planers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Shapers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Sloters	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Barers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Screwers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Machine drillers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Hand drillers†	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Smiths	32 6	32 6	34 6	34 6	34 6	34 6	35	35 6	35 6	35 6	37
Strikers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Coppersmiths	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Joiners	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Plumbers	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Tinsmiths	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Grinders	29	27	28	28	28 6	28 6	29	29 6	29 6	29 6	31
Labourers	18 6	18	19	19	18	18	19	19	19	19	19
Boiler shops—											
Angle iron smiths ..	30 6	30 6	32 6	32 6	32 6	32 6	34	34 6	34 6	34 6	36 6
Platers	35	33	35	35	35 6	35 6	37	37 6	37 6	37 6	39
Riveters	32	32	33 6	33 6	33 6	33 6	34 6	34 6	34 6	34 6	36 6
Caulkers	33 6	33 6	35 6	35 6	35 6	35 6	37 6	37 6	37 6	37 6	39 6
Holders-up	25	25	26 6	26 6	26 6	26 6	28	28 6	28 6	28 6	30 6
Labourers	18 6	18	18	18	18	18	19	19	19	19	19
Angle iron smiths ..	26	22 9	21	21	21	21	22 9	22 9	22 9	22 9	24 9
Strikers	26	22 9	21	21	21	21	22 9	22 9	22 9	22 9	24 9

(a) Chiefly from the *Chronicle in Barrow* reports. Some of the changes are carried forward on the basis of the 1893 II return.

† Hand drillers in boiler shops, 1884, 21s. 6d., 1886, 21s., 1888, 22s., 4s. Apparently rose in 1898 and fell in 1903.

TABLE 18.—BARROW. *Wages for an Ordinary Week's Work in Shipbuilding, 1884—1904.*

Year	1881.	1886.	1888.	1890.	1893.	1894.	1896.	May, 1898.	1887.	1888.	1889.	1890.	1891.	1892.	1893-95.	1896.	1897.	1898-1901.	1902.	1903-04.
Authority	Z.	Z.	Z.	L.	H.	Z.	Z.	Z.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.	P. and Y.
Time or Piece- work.																				
Angle-ironsmiths	S. 32	S. 29 6	S. 35 6	S. —	S. 36 10	S. —	S. 38 4	S. —	S. 34	S. 35 6	S. 38 4	S. 38 4	S. 38 4	S. 36 10	S. 36 10	S. 36 10	S. 36 10	S. 36 10	S. 36 10	S. 36 10
Platers	T. 31	T. 30	T. 36	T. 37 6	T. 37 3	T. 34 9	T. 36 3	T. 37 3	T. 32	T. 33 6	T. 36 3	T. 36 3	T. 36 3	T. 31 9	T. 31 9	T. 31 9	T. 31 9	T. 31 9	T. 31 9	T. 31 9
Riveters	T. —	T. 32	T. 30	T. 37 6	T. 35	T. 32 6	T. 31	T. 35	T. 30	T. 31 6	T. 31	T. 31	T. 31	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6
Caulkers	T. 30	T. 29	T. 31 6	T. 70 6	T. 35	T. 32 6	T. 31	T. 35	T. 30	T. 31 6	T. 31	T. 31	T. 31	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6
Holders-up	T. 19	T. 18 6	T. 25 6	T. 71	T. 26 6	T. 34 6	T. 28	T. 37 7 1/2	T. 24	T. 25 6	T. 28	T. 28	T. 28	T. 26 6	T. 26 6	T. 26 6	T. 26 6	T. 26 6	T. 26 6	T. 26 6
Shipwrights*	T. 31 6	T. 30 6	T. 32	T. 36	T. 33 6	T. 33 6	T. 36 6	T. 37 1 1/2	T. 30 6	T. 32	T. 36	T. 36	T. 36	T. 35	T. 34	T. 33 6	T. 33 6	T. 33 6	T. 33 6	T. 33 6
Shipjoiners	T. 31	T. 29	T. 30	T. 35	T. 33 6	T. 33 6	T. 36	T. 37 1 1/2	T. 29	T. 30 6	T. 33	T. 35	T. 35	T. 31	T. 31	T. 33 6	T. 36	T. 38 3	T. 38 3	T. 38 3
Plumbers	T. —	T. —	T. —	T. —	T. 33 9	T. 33 9	T. 34 9 10	T. 36	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. 33 9	T. 36	T. 38 3	T. 38 3	T. 38 3
Painters.....	T. —	T. —	T. —	T. —	T. 32 3/4	T. 32 3/4	T. 33 9	T. 35	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. 32 3	T. 33 9	T. 35	T. 35	T. 35
Sawyers	T. —	T. —	T. —	T. —	T. 18 6 3/8	T. 20 6 3/8	T. 20 6 3/8	T. 25	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. 31	T. 32	T. 33	T. 33	T. 33
Smiths	T. 30	T. 28	T. 29 6	T. 33	T. 31 6	T. 31 6	T. 31 6	T. 35	T. —	T. 31 6	T. 33	T. 31	T. 31	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6	T. 32 6
Smiths' strikers	T. 20	T. 19	T. 20 6	T. 33 6	T. 21	T. 21	T. 22	T. 22 6 23	T. —	T. —	T. —	T. —	T. —	T. 21 6	T. 21 6	T. 21 6	T. 21 6	T. 21 6	T. 21 6	T. 21 6
Fitters	T. 30 6	T. 30	T. 31	T. 31 6	T. 32 6	T. 31 6	T. 31	T. 35	T. 30 6	T. 32	T. 33	T. 31	T. 31	T. 32 6	T. 32 6	T. 31 6	T. 31 6	T. 31 6	T. 31 6	T. 31 6
Drillers	T. —	T. 21	T. 21	T. 51	T. 24	T. —	T. —	T. 23 6 24	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —
Platers' helpers	T. —	T. 18	T. 18	T. —	T. 18	T. 18	T. 18	T. 17 6 21	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —
Re-lead-ers	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —
Labourers	T. 18 6	T. 20	T. 18	T. 19	T. 18 1/2	T. 18	T. 18	T. 18—20	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —	T. —

* From 1893 and possibly earlier, shipwrights include spar-makers and boat builders.

† Some were higher, *v.g.*, shipwrights' labourers, 18s. and 19s.

(a) 1s. over 1891.

(b) *id.* and 1s. over 1891.

BARROW.

In 1879 the engineers report a strike "*re* wages," which ended in their preserving the "9 hours." This suggests that as in one or two other centres they were offered the alternatives of a reduction in wages or increase of hours and accepted the former. In December, 1883, they report a notice of reductions, the ship-builders and moulders of 5 per cent., and the engineers of 4s. In 1886 they report that they are now threatened with a further reduction of 10 per cent., two, amounting to 3s., having already been accepted. This reduction appears to have been carried out. In 1887 the Steam Engine Makers report that they had been offered "full time at 1s. reduction," but they preferred to remain on short time. In 1888 the engineers report an advance of 1s. 6d. all round. Early in 1889 two increases of 1s. brought the standard wages of fitters to 33s., and of turners to 34s. The smiths also had increases of 1s. 6d. and 5 per cent. in this year, and in 1890 fitters, turners and smiths got increases of 1s., the smiths petitioning for a minimum of 34s., which was granted. Apparently no changes occurred in 1891, but in 1892 17 trades received reductions of 1s. on wages 30s. and above (with 6d. more to follow on 1st January, 1893), 1s. on wages 25s. to 30s., 6d. on wages 20s. to 25s., but nothing was taken off wages below 20s. In 1893 a further reduction of 1s. to those at 25s. and over, and 6d. to those under 25s. was made. This is reported by the smiths, but seems to have been applicable to most, if not all, of the engine-shop workers.

II.—*The International Statistical Institute.*

By SIR J. ATHELSTANE BAINES, C.S.I. (*Honorary Foreign Secretary*).

THE tenth Congress of this Institute, to which reference has been made in this *Journal* on several previous occasions,¹ was duly held in London, between the 31st July and the 4th August. It is not in these pages that judgment is to be passed upon the degree of success which attended the efforts of the Society to maintain the reputation as hosts which it acquired in 1885, but any chronicle of the event would be incomplete without an expression of the grateful recognition owed by the Society to its Honorary President, H.R.H. the Prince of Wales, for the cordial and appreciative welcome he gave to the Institute in opening the Congress in the capacity of its Honorary President; and to the President of the Society, the Earl of Onslow, for his hospitality and genial participation in the

¹ See p. 490, 1904, and pp. 93 and 366, 1905.

cereemonial gatherings which formed, as usual, a not unimportant feature in the proceedings. The Society has also to record its hearty acknowledgment of the kind cooperation in the duties of entertainment of the Committee of the Imperial Institute and the London University, who placed their ample and convenient accommodation at the disposal of the Congress; of the Right Hon. the Lord Mayor (Sir John Pount, Bart.) for the hospitality, traditional to the Mansion House, with which he welcomed the Congress at an inaugural banquet, and of the Fishmongers, the Drapers, the Clothworkers and the Mercers' Companies, for their material contributions to the amenities of the visit of our foreign colleagues. Finally, the Society is entitled to congratulate itself upon the loyalty of its Fellows exhibited not only in the subscription list, but also in the attendance on the occasions where their presence as hosts could not but be construed as a token of goodwill towards the Congress and of interest in its work.

In connection with this last point, it must be admitted that the date fixed for the Congress was anything but the most convenient that could have been chosen had the wishes of this country alone been in question. The London season being over, and Parliament being in the last week of its Session, the statisticians of the metropolis were by no means singular in having put up their shutters and taken wing for a few months of a less strenuous life. On the other hand, the exigencies of University duties in several of the countries strongly represented on the Institute precluded the selection of an earlier date, and, as it turned out, the choice was justified by the attendance.

Bringing up to date the table given on p. 424 of the 1904 volume of this *Journal*, the ten meetings of the Institute give an average attendance of 111, of whom 51 would be members and 60 visitors. The latter figure, however, is greatly increased by the abnormal number of guests invited to take part in the Berlin Congress, omitting which, the average would fall to 48, or a total of 99. On the present occasion, the total attendance was 98, a number which has been exceeded at Berne, in 1895 and at the three last meetings. The muster of members, however, was 65, or 14 above the average, and thus takes the second place, Berlin with 80 standing first. Although the number of invited persons fell short of the average, the deficiency is not found amongst the foreign guests, but amongst our own countrymen. This is quite in accordance with the policy adopted by the Society for the occasion, it being held undesirable to weaken the international character of the gathering by too strong an admixture of the local element. At the same time, it must be admitted that the attendance of British members of the Institute, which was only 17 out of 29 on the roll, was unexpectedly below the mark. For this, however, the date of the meeting and the counter attraction of the South African expedition of the British Association may be held mainly responsible. The representation of the different countries was as under:—

Countries.	Members of the Institute Present.	Invited Persons.	Total.	Of whom Official Delegates
United Kingdom	17	9	26	8
Germany	13	2	15	—
France	11	3	14	9
Austria	5	5	10	1
Hungary	4	4	8	1
United States	3	3	6	1
Russia	3	1	4	—
Italy	2	—	2	1
Belgium	2	—	2	—
Netherlands	1	1	2	1
Romania	1	1	2	1
Sweden	1	1	2	1
Norway	1	—	1	1
Denmark	1	—	1	1
Japan	—	1	1	1
Switzerland	—	1	1	1
Spain	—	1	1	—
	65	33	98	28

There were unfortunately missing from the Congress several familiar faces whose absence was universally regretted, both on account of their personal popularity among their colleagues, and also of the active interest always taken by them in the discussions and proceedings generally. Two of the three Vice-Presidents, Dr. Tromitsky and Professor Levasseur, were unable to be present, the former on account of ill-health, the latter by reason of a severe domestic affliction, which was made the subject of a vote of condolence by the Congress. Nor was that veteran statistical hero, Senator Bodio, present, his absence being all the more regretted because he sent a message that he found himself compelled by circumstances to abstain from offering himself for re-election as General Secretary, a post he has filled with signal distinction from the creation of the Institute. Apart from official absentees, all who have worked on the Demographic Section will agree that its proceedings suffered both in profundity and liveliness by the vacancy in the chairs usually occupied by the two great municipal statisticians, Drs. Kőrösi and Bertillon. The whole subject of attendance at the Congresses, together with sundry other statistics relating to the *personnel* of the Institute, is to be found in the latest proceedings of the latter. The Institute started with 23 original members, and has since elected 295 more. In the twenty years of its existence it has lost 88 by death and 32 by resignation, and has now, therefore, a roll of 198. Of these, 31 appear to have never attended a single Congress, and in this category it is regrettable to find the United Kingdom in a bad pre-eminence. In part compensation, however, Major Craigie is the only member who has not missed a Congress, though he is closely followed by 4 of his colleagues, including the chief officers of the Institute. Of the whole 167 who have attended at

all, only 17 have put in an appearance at more than 5 of the 10 meetings, and of the remaining 150, 96 have only been at one or two. In regard to these, it must be borne in mind that 75 members have been elected since the fifth Congress, and that at the last few meetings the attendance, as has been already mentioned, was unusually good.

So far as to the attendance. In regard to the proceedings of the meeting, there is always a good deal of preliminary arrangement necessary, so that, although the Congress did not open until the 31st July, a meeting of the Bureau was held on the 29th, whilst in the evening a dinner in their honour by the Statistical Society Dinner Club was organised by its *doyen*, Mr. Hendriks. Several of the official and non-official members were also entertained on the same day at luncheon by Lord Onslow. On the following day, a party of them, on the invitation of Mr. and Mrs. N. Cohen, lunched and spent the day at Englefield Green.

At 11 o'clock on the Monday the Congress held its inaugural and ceremonial meeting. In the presence of a large audience, including not only members and delegates but also a considerable number of visitors, the Government being represented by Earl Percy, Under Secretary for Foreign Affairs, the Session was formally opened by H.R.H. the Prince of Wales, in the following address of welcome:—

“GENTLEMEN,

“As Honorary President of the Royal Statistical Society, and on behalf of its Members, I offer a most hearty welcome to the Representatives of the International Statistical Institute who are assembled here to-day for the opening of its Tenth Session.

“I feel that, perhaps, on this occasion it would not be out of place if I recalled to your memory a fact which, to me personally, is of peculiar interest. My revered grandfather, the late Prince Consort, who did so much for the progress of Science, was instrumental in rendering special assistance to the first effort of Statistical Science to secure for itself an assured and prominent position in the ranks of the older and better recognised Sciences.

“Quetelet, whose name stands pre-eminent in that Science, was at one time the Prince Consort's Mathematical Teacher, and later on his close personal friend.

“On the occasion of our great Exhibition of 1851, a large and distinguished Company of Statisticians was assembled in London.

“It was chiefly at the instigation of Quetelet that the question of instituting periodical International Congresses for the discussion of questions of common interest and international concern was proposed. In consequence of this proposal an international organisation was formed, and the first International Statistical Congress was held in Brussels in 1853. Later on, in 1860, London welcomed the International Congress, which met under the Presidency of the Prince Consort.

“I feel that on this occasion you will allow me to quote the

following words from his opening address:—‘It is the social condition of mankind as exhibited by enumerated facts which forms the chief object of the study and investigation undertaken by this Congress—The results of its labours will doubtless afford to the statesman and the legislator a sure guide in his endeavours to promote the social development and happiness of the Nation. The importance of these International Congresses cannot be over-rated. They not only awaken public attention to the value of these pursuits by bringing together men of all Countries who devote their lives to this work, and who are thus enabled to exchange their thoughts and varied experiences; they also pave the way to an agreement among different Governments and Nations to follow up these common enquiries, in a common spirit, by a common method, and for a common end.’

“Gentlemen, this watchword of the Congress of 1860 I would endeavour to commend to the Congress of 1905, as worthily embodying its aims and objects.

“Once again in 1885, London was the scene of the labours of an International Statistical Assembly. That occasion was a trebly historic one. The Royal Statistical Society had at one and the same time the gratification of celebrating the Jubilee of its existence, the privilege of entertaining illustrious statisticians, and of assisting the formation of the present International Statistical Institute.

“The Royal Statistical Society will always look back with pride on the happy coincidence of its jubilee with what may be described as a second birth of international statistical co-operation.

“The period of over fifty years has seen a rapid and unexpected development of statistical science. Every widening of the field of its operations, every improvement in the care with which the increased area is nurtured, brings in a more than proportionate harvest. National and social tendencies are now capable of increasingly accurate measurement with the aid of the very numerous statistical tabulation which now exists.

“In the future all branches of social science must look for their advancement and increase of precision to the continually improving character of the raw material furnished them by statistics.

“For scientific progress, however, a primary essential is active and effective co-operation among scientific workers in all countries, in order that publicity can be given to their results, and uniformity obtained in the collection and arrangement of data for the purpose of their common employment. This is the high office you, gentlemen, are called upon to fulfil. The eminence of your positions as statistical workers, and your ardour in the pursuit of your aims, could not be better indicated than by your presence at such a Congress as this.

“The history of the International Statistical Institute is at present a short one. But it has been happy in having a long and distinguished list of members, past and present, of which a far older scientific body might well be proud.

“With the knowledge of your brilliant success in the past, and your aspirations for the future, I now have much pleasure in declaring the tenth session open, with the full assurance that

neither in fertility nor solidity of results will it, in any degree, fall behind its predecessors."

President von Inama-Sternegg followed, and after thanking H.R.H. the Prince for the honour of his presence and the warmth of his welcome, briefly reviewed the programme of the work before them, and referred in appreciative terms to the loss the Institute had sustained by the death, since the last meeting, of several distinguished members. Lord Onslow, as President of the Society, expressed the pleasure which the Society felt in being honoured by the presence of a body like the Institute as its guest, and was supported in this sentiment by Major Craigie, as Chairman of the Committee of Reception. A valedictory letter of sympathy and good wishes from Senator Bodio was read by M. de Foville, and one from Vice-President Troimisky, expressing his regret at not being able to be present, after which H.R.H. the Prince of Wales withdrew, and the remainder of the sitting was occupied with the arrangements to be made for the election of new members, the audit of the accounts, and other official business.

The real work of the Congress began in the afternoon, when the distribution of the members amongst the usual three Sections, dealing respectively with Demography, Economics and Administrative organisation, took place. The attendance at each was unusually large, and, owing to the excellent accommodation allotted by the committee of the Imperial Institute, there was no difficulty in arranging for the comfort and convenience of the sitting. The Demographic Section unanimously voted to the chair its former president, Prof. von Mayr, and Mr. Balleine and Dr. H. Hasse were assigned to it as secretaries. In the Economic Section, M. Yves Guyot was elected chairman, and the experience and linguistic attainments of Mlle. Kovanko, our Russian guest, were enlisted for the duties of secretary. M. Delatour presided over the third section, with M. Yvernès as secretary. Papers of considerable length and interest were discussed in all three sections, reference to which will be found later in this chronicle.

At the Mansion House, in the evening, the Lord Mayor had invited to meet the Institute a large number of the Fellows of the Society still left in London, together with many guests of repute in the business world and alive to the importance of the subjects a congress like this aimed at elucidating. After the usual loyal toasts had been proposed by the Lord Mayor, that of the Institute, its President and Members was given by the Right Hon. Leonard Courtney, an ex-President of the Statistical Society. He expressed his enthusiastic devotion to everything that was international, and which, like this gathering of picked men of each nation, tended to make them understand that under many and varied forms they ought to be working together for the common preparation of peace and human development. After a passing reference to the discredit thrown upon statistics by the habit of misreading and misrepresenting them, he said he was convinced that there was a poetry in statistics, and that those who had the gift divine

were able to see in arrays of figures, dull and uninviting to others, pictures of the movements of life as exciting and interesting as any poetry could contribute. The rise, growth and decay of nations could be surveyed in the records of this science, and the problems it was called upon to face had a special interest for the great city of London, where all the material, industrial and enterprising conditions of life had been brought together. He thanked the Institute for the labour it was bestowing upon the problems of humanity in which all present were deeply interested. President von Inama-Sternegg, in responding, thanked their host for receiving them with such distinction in the city where all statisticians felt themselves at home, if only for the opportunity it gave for the study of the statistical effects of the increase in urban population, not only by immigration but also by the natural excess of births over deaths, the latter being largely due to the advances made by science in sanitation, and the municipal foresight with which they were put into practice. The toast of the Royal Statistical Society was proposed by M. Yves Guyot, in the capacity, he said, of an ex-President of the daughter society of Paris. In the course of his administrative life he had discovered that statistical science was by no means a "maid of all work," but the servant of one employer only, the truth, and in this respect the Royal Statistical Society had set an example of scientific probity which the Institute, founded by an ex-President of that Society, intended to follow. The Earl of Onslow, in reply, said that the Society would endeavour with the greatest zeal and pleasure to fulfil to the Institute the duties of host, which in other countries would be performed by an official Statistical Department. These duties were all the more congenial owing to the interchange of goodwill and esteem between those of different nations, which shared the attention of the Congress with the discussion of statistical facts. If the facts supplied by the statistician were somewhat dull, the inferences drawn from them by the statesman were always entertaining, and whilst the former confined himself to actualities, the latter often winged his way into the realms of prophecy. Often, moreover, the statistician was found administering a douche of cold water to the philanthropist, but it could hardly be denied that the latter was not seldom in need of such treatment. He expressed the hope that during the time they spent in London the members of the Institute would enjoy themselves, and he was certain that the results of their labours would promote the interests they all had at heart. In proposing the health of the Lord Mayor, Vice-President Professor Lexis remarked that as in England alone had the secret been discovered of combining civilisation, progress and art, so the symbol of that union was to be found in the city of London, which, dating from the days of Boadicea, now represented the commerce of the world. The Lord Mayor briefly expressed his thanks for the cordiality with which the toast had been proposed and received.

In the morning of the second day of the Congress there was a general sitting, at which the principal business was the voting for

13 candidates, and the discussion of some propositions as to inquiry into the mortality in large towns, submitted by the Demographic Section after their discussion of the preceding afternoon. Some difference of opinion was manifested, and, in the end, the original suggestions were somewhat severely pruned. There was no sitting in the afternoon, the Congress having adjourned to lunch with the Fishmongers' Company, and afterwards to witness the watermen's race for Doggett's Coat and Badge.

The general sitting of the third day began with the welcome announcement that all the thirteen candidates had received the qualifying number of votes, an unusual termination of a somewhat complicated process. Messrs. Thomas and Yule, Fellows of the Society, were amongst those elected. A report was submitted to the Congress on the completion of the second section of the exhaustive work of Messrs. Levasseur and Bodio on the area and population of the earth. America is herein dealt with. It was also reported that in the matter of facilitating demographic investigation in countries where no census had been taken, the Institute was in co-operation with the International Geographical Congress. The report of the Treasurer, Sir Alfred Bateman, on the finances of the Institute, was presented and made over to the auditors, who duly reported upon it. The thanks of the Congress were voted to those concerned, with personal congratulations to Sir Alfred Bateman upon his restoration to health. M. Neymarck presented a further instalment of his comprehensive inquiries into "Transferable Securities," and the proposals of the Economic Section as to the establishment of a basis of comparison of the "Zahlungsbilanz" of different countries were adopted, though the exact rendering of the title in other languages was perhaps left in doubt. The afternoon was devoted to Committee work, and all three Sections were busily engaged on their respective subjects, the third Section in particular not finishing its discussions until an unusually late hour.

In the evening a dinner was given at the Hotel Metropole by the Society to the members of the Institute and the ladies who accompanied them. It was also attended by a considerable number of Fellows of the Society unconnected with the Institute otherwise than as joint hosts. The Earl of Onslow, of course, presided. In giving the second toast, that of the Queen and the rest of the Royal Family, his Lordship referred especially to the service rendered to the Congress by H.R.H. the Honorary President by his presence and speech at the opening ceremony. The toast of the Sovereigns and Rulers of the countries represented was proposed by the Earl of Mansfield, and the reply by His Excellency the Danish Minister had special significance in view of the invitation extended two days later to the Institute, to hold its next Congress at Copenhagen. The health of the Institute, coupled with the name of its President, was proposed by the Chairman, and was all the more acceptable to the majority of the foreign guests from being given in most excellent French. In its English version it runs as follows:—

"I have now to propose the most important of our toasts, as we say in England, the toast of the evening—that of the distinguished President, Dr. Von Inama-Sternegg, and to welcome you to London, the city which is the birthplace of the first International Society, as well as the cradle of the present Institute. Both took their origin under the auspices of the Royal Statistical Society, and that Society welcomes back the sturdy infant, now grown to man's estate. Though we English have no Government Department of Statistics, and are on that account unable to give you the official welcome accorded to the Institute in other capitals, we trust you have carried away the impression, which it was certainly our intention to convey, that your meeting is of the greatest interest to the Rulers of this country. Your session was opened by the Heir Apparent to the Throne of the British Empire, and attended by Earl Percy, the Under-Secretary of State for Foreign Affairs, while your deliberations have been attended by officials of the Colonial Office, the Board of Trade, and the Board of Agriculture. We private statisticians are largely dependent on the liberality of our several Governments. We cannot make bricks without straw, and the straw of the statistician costs a lot of money to collect. In countries such as the United States of America and the Continental States, where agriculture is still the most important of industries, the collection by the State of agricultural statistics leaves little to be desired. I wish I could say the same of this country. The marvel is, not that our returns are meagre, but that, with the small staff at our command, they are as complete and as promptly made up as they now are. We wish, during your stay in this country, to draw your attention not only to the statistics and condition of the United Kingdom, but more particularly to that of the Colonies and Dependencies of our Empire. So long as the over-sea possessions of France, Germany and the United States were comparatively insignificant, the over-sea possessions of Great Britain may not, perhaps, have had the same interest for an International Institute, but now that we are all Asiatic and African as well as European Powers, we must look on each other as nations whose overflow of population brings us constantly in contact outside that corner of the world we call Europe. Our interests no longer affect only the races to which we belong, but they affect hundreds of millions, who, though not of our race, have become subjects of our respective Sovereigns. We can consider these questions with the special equanimity at this moment, because the thunder clouds which, for a time, obscured the sun of concord in our international relations have, at least for the moment, and, let us hope, for all time, melted away under the wise guidance of sovereigns and statesmen bent on the maintenance of international peace. I alluded on a former occasion to the great service rendered by statisticians to statesmen in determining problems of administration or legislation. It was part of my duty to consider the statistics put forward by the International Congress for the consideration of the fishery problems of the North Sea. Nothing then struck me more forcibly than the need for the application of the most rigid tests to the figures on which a theory is formed. If those figures are insufficient, if they are taken over too large, or too small, an area, they may lead to erroneous deductions on which, if legislation is founded, the gravest injury may be done to a great industry. It seems to me that sufficiency of figures and true comparability of conditions are essential elements, if we are to continue to appeal to the arbitrament of figures. Again, when comparing statistics, especially international statistics, it is of the utmost importance that they should be collected with the same care, and collated on the same basis. Our

great poet, Shakespeare, has portrayed all men and women as actors on the world's stage. It is in all those scenes of life that the statistician has to follow them. He must count the infants in the nurses' arms. He must know how many boys there are in the school, and what they learn; whether their subsequent calling is that of the soldier, or what it is. He must know the result of the lover's sighs, and, if they attain to matrimony, how far he is blessed with descendants. When he comes to magisterial discretion, the statistician inquires on what crimes he sits in judgment; and, finally, he asks to know the time and manner of his exit from this earthly stage. The statistician may be dull, but he is indispensable to the comity of nations. He has upon occasions provoked the satire of the vaudevillist, but the shafts have been directed against the statistician gone mad. There is a character in one of the vaudevilles whose boast is that of having ascertained the precise number of widows who crossed the Pont Neuf in a given year—13,498, and one doubtful! Even our satirists have not been without their use to us, in drawing attention to the scrupulous care with which our work is done, as in the case where Louis Reybaud's statistician, in *Jerome Paturot*, is made to tell Jerome of the three and a half milliard sheaves and a half sheaf of wheat harvested in Spain. 'Note,' says he, 'that half, it is essential—that half seizes the public mind. "Voyez," dit-on, "quelle exactitude. Ces gens-là comptent jusqu'aux fractions;" et votre chiffre est désormais parole d'évangile.' You have no theories, no dogmas. You pursue truth, and truth only. She may show us that we are following paths that we are not intending to pursue; it is for us to leave them and pursue others. You have no 'labels,' no party cries. Your methods may be slow, but they must at least be sure. Truth and falsehood are mingled as they enter the stream of time, but that stream inevitably separates truth from falsehood at the last. In England we are fond of describing our legislation and our jurisprudence as broadening down from precedent to precedent, and, in like manner, must the ascertained facts of one generation of statisticians lead on to greater and greater certainty, culminating in that incontrovertible truth upon whose eternal laws all human happiness depends: *Magna est veritas et prævalebit.*"

After Sir Alfred Bateman had proposed the health of the ladies who had honoured them with their presence, Professor von Mayr (Germany) gave the toast of "Prosperity to statistical science," to which replies were made by Cavaliere Raseri (Italy), Professor de Lång (Hungary), and Dr. Atkinson (United States of America). The health of the Chair, with the thanks of the Congress for his courteous hospitality, was proposed by M. de Foville (France) in his usual felicitous manner, and Lord Onslow, in acknowledging it, hoped that, irrespective of the scientific advantages which might result from the Congress, the sojourn of its members in England might prove to have given as much pleasure to them as it conferred distinction upon their hosts.

The general sitting of Thursday morning began with the adoption of a new set of rules governing the election of members, slightly modified by the official staff from that proposed by M. Nicolai. The rest of the sitting illustrated the value of committee work, various suggestions being adopted which could not possibly have been dealt with had they not been well threshed out before being brought forward. Amongst these was an elaborate series of propositions relative to the taking of an industrial census on lines suitable for

international comparison, including an understanding as to what should be defined as "unemployed." On the other hand, the recommendation of the Administration Section, that the highly complicated system of registration of population, framed with great care and detail by M. Nicolai, should be made compulsory, was diluted by the collective wisdom of the Congress into the expression of a Platonic wish to see such a system more generally in force. Sub-committees were appointed to inquire into the statistics regarding tuberculosis and the basis of an international comparison of wages. The non-committal resolution sent up by the Economic Section on the potentially electric subject of the effect of customs duties proved an efficient lightning-conductor, and evoked but the smothered mutterings of detached thunder-clouds. Sir A. Bateman's proposals on the improved classification of imports and exports were confirmed.

The afternoon saw the conclusion of the committee work. The Demographic Section spent its whole time over M. Kier's paper on the fecundity of marriage. The economists worried down two papers of an agricultural character, and the third section was fully occupied with an important discussion of statistics of workmen's accidents.

The last day of the Congress began with the general sitting for the reception of papers by Dr. Loch, on International Statistics of Pauperism; by Professor Mandello, on the Future of Statistics; and by Professor Fahlbeck, on the Decline and Extinction of Peoples. Major Livi, also, gave an abstract of the valuable results of anthropometrical inquiry in the ranks of the Italian army. The time for discussion was short, and Dr. Loch's proposals, accordingly, had to be made over to a committee for consideration at the next meeting. An audacious suggestion, however, having been thrown out by Professor Mandello to the effect that there appeared to be room for entailment in the mass of figures published by the various Governments, those present who were connected with official statistics would not be denied, and, in the dialect of West Africa, "palaver done lib."

At the final assembly, which was mainly ceremonial, the following telegram, sent by the President to H.R.H. the Prince of Wales, was read:—

"At the close of its Tenth Congress, the International Statistical Institute desires to express its unanimous and cordial thanks to H.R.H. the Prince of Wales for the honour conferred upon it by his acceptance of its Honorary Presidentship, and for the services rendered by His Royal Highness in that office."

To this the following reply was received:—

"MAJOR P. CRAIGIE.

"Please convey following message to President, International Statistical Institute: I sincerely thank members of Institute for kind sentiments to which your message of to-day gives expression.

(Signed)

"GEORGE."

Thanks to the Royal Statistical Society, and to Major Craigie as representing its Reception Committee, were rendered by the President, and then M. Koefoed, in the name of the Government of Denmark, invited the Institute to hold its next Congress in Copenhagen, a proposal warmly accepted. Then followed a short valedictory address by the President, and the Institute proceeded to the election of its officers for the ensuing two years. Previous to the ballot, Dr. von Inama-Sternegg pronounced a well-merited eulogy upon Senator L. Bodio for the share he had taken in the organisation of the Institute, and stated that pending the election of his successor, the duties of the General Secretaryship had been temporarily undertaken by Major Craigie, whose assiduity in the work of the Institute was gratefully recognised by all the members. The ballot resulted in the unanimous re-election of Dr. von Inama-Sternegg as President, of Sir A. Bateman as Treasurer, and of Messrs. Troinitsky, Lexis, and Levasseur as Vice-Presidents, whereupon the Congress broke up.

In the evening the members were entertained by the Society at a conversazione in the Botanical Society's Gardens, with the addition of an excellent performance of the "Midsummer's Night's Dream" on a picturesque knoll in the grounds. On the next day an excursion took place to Windsor, where, after visiting the Castle by the express permission of H.M. the King, a final entertainment was provided by the Society in the form of a lunch, followed by a trip on the Thames, which concluded the proceedings of this memorable week. In connection with the non-statistical side of the visit, it was a source of gratification to the Society to find so many members of the Institute were bringing the ladies of their family to London, and, in order to provide for their entertainment whilst the Congress was engaged in its business, a committee was formed under the chairmanship of Lady Bateman, which, through her exertions and those of Mesdames Cohen and Wilson-Fox and Miss B. L. Hutchins, found some species of hospitality and sight-seeing for each day of the visit.

The opportunity is here offered of recording the acknowledgment by the Reception Committee of the excellent editorship of the Daily Bulletin of the proceedings by Mr. E. S. Bateman, who accomplished the difficult task of getting this important business performed punctually and correctly. The Committee were also greatly indebted to Dr. Ginsburg for organising the arrangements for accommodation at hotels and for the various entertainments; and they wish to recognise, too, the incessant work and attention of Mr. J. A. Cable, late Assistant Secretary, both before and during the Congress, as well as the staunch cooperation of the Society's staff generally in the various and often pressing duties imposed upon it.

The present contribution treats of the Congress in its historical aspect only, and the statistical side of the meeting has been left to be dealt with on a future occasion.

III.—*Agricultural Returns of Great Britain, 1905.*

PRELIMINARY statement for 1905, compiled from the returns collected on the 5th June, and comparison with 1904:—

CROPS.

Distribution.	1905.	1904.	Increase.		Decrease.	
	Acres.	Acres.	Acres.	Per cent.	Acres.	Per cent.
Total area of land and water.....	56,787,669	56,787,669	—	—	—	—
Total acreage under all crops and grass*	32,286,832	32,317,610	—	—	30,778	0·1
Wheat	1,796,985	1,375,281	421,701	30·7	—	—
Barley	1,713,661	1,840,684	—	—	127,020	6·9
Oats	3,051,376	3,252,962	—	—	201,586	6·2
Rye	62,197	55,711	6,483	11·6	—	—
Beans	254,765	252,782	1,983	0·8	—	—
Peas	175,235	175,608	—	—	373	0·2
Potatoes	608,471	570,209	38,262	6·7	—	—
Turnips and swedes...	1,589,273	1,601,104	—	—	11,831	0·9
Mangold	404,123	398,827	5,296	1·3	—	—
Cabbage	67,758	61,607	3,151	4·9	—	—
Kohl-rabi	17,587	15,607	1,980	12·7	—	—
Rape	93,881	97,772	—	—	3,891	4·0
Vetches or fares	136,429	128,229	8,200	6·4	—	—
Lucerne	53,410	55,721	—	—	2,311	4·2
Other crops	106,120	100,917	5,173	5·1	—	—
Clover and rotation grasses—						
For hay.....	2,189,288	2,322,895	—	—	133,697	5·8
Not for hay	2,288,232	2,348,600	—	—	60,368	2·6
Total	4,477,520	4,671,495	—	—	193,975	4·2
Permanent grass—*						
For hay.....	4,688,520	4,765,403	—	—	76,883	1·6
Not for hay	12,511,974	12,332,653	179,321	1·5	—	—
Total	17,200,494	17,098,056	102,438	0·6	—	—
Flax	441	563	—	—	122	21·7
Hops	48,968	47,799	1,169	2·4	—	—
Small fruit	78,822	77,917	875	1·1	—	—
Bare fallow	349,313	432,690	—	—	83,377	19·3
Orchards†.....	214,323	213,008	1,315	0·5	—	—

* Excluding 12,763,099 acres returned as mountain and heath land used for grazing in 1905, and 12,788,156 acres in 1901.

† The acreage of any crop or grass grown under the trees in orchards is also returned under its proper heading.

LIVE STOCK.

Distribution.	1905.	1904.	Increase.		Decrease.	
	No.	No.	No.	Per cent.	No.	Per cent.
Horses used for agricultural purposes*	1,122,419	1,120,217	2,172	0·2	—	—
Unbroken horses—						
1 year and above	310,333	301,371	8,962	3·0	—	—
Under 1 year	139,681	138,618	1,063	0·8	—	—
Total of horses	1,572,433	1,560,236	12,197	0·8	—	—
Cows and heifers in milk or in calf	2,707,392	2,678,680	28,712	1·1	—	—
Other cattle—						
2 years and above	1,415,317	1,374,636	40,681	3·0	—	—
1 year and under 2	1,471,070	1,429,833	41,237	2·9	—	—
Under 1 year	1,393,241	1,375,203	18,038	1·3	—	—
Total of cattle ...	6,987,020	6,858,352	128,668	1·9	—	—
Ewes kept for breeding	9,935,766	9,880,908	54,858	0·6	—	—
Other sheep—						
1 year and above	5,117,517	5,313,602	—	—	166,085	3·1
Under 1 year	10,173,913	10,012,668	161,245	1·6	—	—
Total of sheep ...	25,257,196	25,207,178	50,018	0·2	—	—
Sows kept for breeding	335,008	320,056	—	—	47,048	12·3
Other pigs	2,089,911	2,479,588	—	—	389,677	15·7
Total of pigs ...	2,424,919	2,861,644	—	—	436,725	15·3

* Including mares kept for breeding.

BOARD OF AGRICULTURE AND FISHERIES,
25th August, 1905.

IV.—Notes on Economic and Statistical Works.

The Principles of Economics and other Papers. By the late W. Stanley Jevons, LL.D., M.A., F.R.S.; with a Preface by Henry Higgs. xxviii + 273 pp., 8vo. London: Macmillan and Co., 1905.

That the death of Jevons, when his intellectual powers were perhaps at their ripest, was a most serious misfortune for English Economics has been generally admitted; and Mr. Higgs is not exaggerating when, in the Preface to the present volume, he states that "among the economists of all time Jevons unquestionably stands in the first rank." By statisticians in particular the regret felt for his premature decease was unmistakably poignant; for in the rare union of qualities which he possessed, the combination of exceptional statistical aptitude with uncommon economic attain-

ment was not the least remarkable. From his "Life and Letters" we learn that his early aspiration was to be a "recognised statistical writer," and the rich fulfilment of this youthful ambition could not be overlooked in any full or faithful record of his subsequent distinguished career. It is indeed hardly fanciful to attribute his simultaneous success in theoretical and practical economics alike largely to his keen and informed appreciation of the possibilities and limits of statistical inquiry. For as theoretical economist Jevons knew how to be original without becoming eccentric, and as practical economist his sustained courageous enthusiasm for social reform was guided and controlled by a mingled sobriety and acumen, which recommended him, as we learn from some of these papers afresh, to the attention, and even to the confidence, of such able administrators of our national finances as Lowe and Gladstone.

The persuasive pamphlet on the unpopular Match Tax, reprinted in this volume, would suffice to indicate the closeness of the relations existing between Jevons and the former statesman; and Mr. Higgs' interesting observations in the Preface on the circumstances attending the removal of the registration duty on corn would confirm this impression. It may be noticed in passing, for the information of our present fiscal controversialists, how remarkably many of the arguments now advanced in the discussion of Mr. Chamberlain's proposals were anticipated almost verbally in the quotations here made by Mr. Higgs from Lowe's speeches in Parliament on the latter subject. Lowe indeed cannot be pronounced to have been strikingly successful in his projects and actions at the Exchequer, although this paper of Jevons on the Match Tax should, we think, convince the impartial student, at any rate at this distance of time, that not a few cogent arguments could be advanced in favour of that unfelicitous proposal. But it will be remembered that a greater and more successful Chancellor of the Exchequer than Lowe was ready to acknowledge his indebtedness to Jevons; for Gladstone's advocacy of the reduction of the National Debt was confessedly due to the reasoning of Jevons' "Coal Question."

Jevons indeed occupied a unique position. He was distinguished alike as theoretical economist, as practical reformer, and as capable statistician; and for these various reasons economists and statisticians will, we are sure, hasten to welcome the careful preservation of anything that proceeded from his vigorous pen. They would certainly unfeignedly regret any deprivation of the fresh opportunities for appreciative study of his writings, whether occasional or systematic, which are offered by this volume. It affords a convincing demonstration of the versatility of his accomplishments. The occasional papers cannot be justly described as fugitive, and the fragmentary treatise will, we think, often be found suggestive, even by those who are fully acquainted with the more recent developments of economic thought. Mr. Higgs has therefore conferred considerable benefit upon Economics by this publication; and the scrupulous care with which he has superintended its passage through the press and endeavoured to verify the different references, is no less conspicuous than the exact generosity

with which, in the Editorial Preface, he has indicated the respective claims of the various parts of the book to the attention of readers.

Besides the persuasive pamphlet on the Match Tax, to which reference has already been made, the miscellaneous papers reprinted in the volume comprise two articles dealing respectively with Richard Cantillon and with the Future of Political Economy. Both unquestionably deserve more permanent and distinct preservation than they could receive when buried with other articles in the bound volumes of the periodicals in which they appeared. Mr. Higgs' language regarding the article on Richard Cantillon is not unduly eulogistic. He says that "it would be impossible to mention a more beautiful example of literary research in the history of economic theory, in which it now occupies an imperishable position." The article furnishes an apt and convincing illustration of the keen and informed interest which Jevons always took in economic bibliography; and Mr. Higgs, speaking from the standpoint of a recognised authority on the particular topic handled here, pronounces that "upon the information before him," when he wrote his article, "the judgment and instinct of Jevons were wonderfully true." This single paper in fact finally rescued from undeserved oblivion the "first systematic treatise on economics." In the other article on the Future of Political Economy we pass from exploration into the origin to anticipations of the destiny of Economics; and every reader may possibly not agree with all the conclusions reached by Jevons. But no one can fail to recognise the rich suggestiveness of his purview, and the large catholicity of his judgment. The final paper on the Pressure of Taxation appears to us of somewhat slighter value than the others, but, as it was originally printed as an appendix to the pamphlet on the Match Tax, and bears, as Mr. Higgs shows, on the registration duty on corn, it has earned its inclusion in the volume.

The earlier part of the book is occupied by the fragmentary treatise. This is undeniably only a fragment, and, as Mr. Higgs observes, it may be doubted whether it "contained anything absolutely new at the time when it was written." We must confess, however, to a regret that, in consequence no doubt of certain unavoidable obstacles, of which Mr. Higgs furnishes some account, the fragment was not placed before the public at an earlier time than the present date. For, even if the remark we have quoted from Mr. Higgs' Preface be broadly true, and the completed portion of the treatise was not "absolutely" new when it was first composed, yet later developments of economic study, which, Mr. Higgs justly says, have not appreciably affected the validity of the arguments here presented, in spite of the searching criticism they have generally directed upon the "traditional reasoning" of English economists, have nevertheless robbed Jevons' observations of some of their freshness and have made them seem more like trite and familiar commonplace. And yet the peculiar merit of his writing lay particularly in his unique capacity for the original and striking exposition of conceptions which might perhaps not always themselves in strictness deserve

to be called original. In fact the negligent student, approaching Jevons after other authors, might easily suspect that a wider gulf parted what he was now perusing from what had previously become familiar than existed in reality. None the less certainly the swift discernment with which Jevons seized, and the sure and convincing skill with which he emphasised, the essential aspects of a topic could not fail to be peculiarly attractive to the intelligent and enthusiastic student. They came to him with all the stimulus at least of a fresh and appropriate mode of statement; and on this account we cannot but feel that some unintended injustice may have been wrought to Jevons' real deserts by the long interval which has, perhaps necessarily, parted the publication of this fragment from his death. For we have little doubt that, had he himself lived to complete his scheme, and the treatise as a whole had been given to economists twenty years ago, it would have been acknowledged by them promptly and widely as one of the classical productions of English Economics.

It should be remembered moreover that it was distinctly intended to enable the plain man, who could not hope to grapple with the technical mathematics of Jevons' own earlier "Theory," to become acquainted with the fundamental conceptions and bearings of that theory; and since Jevons' death this need has not grown less urgent. For the particular difficulty of recent developments of theoretical speculation, which is peculiarly calculated to alarm or even to repel the ordinary citizen, can hardly be declared to have become less patent or serious, as economic ability, especially perhaps in this country, has taken more decidedly than before a mathematical direction, and has mastered successfully nicer, more elaborate, and more complex refinements of mathematico-economic reasoning. The clearness and directness which belong to an expositor of Jevons' rare capacity, have certainly not become less desirable characteristics of a systematic economic treatise. Of that clearness and directness the chapters of the fragment on the "Industrial Mechanism of Society" contained in the present book furnish appropriate and striking illustration.

Nor indeed are they lacking in repeated evidence of that facility for originality of statement which we have noticed as a conspicuous possession of their distinguished author, and accordingly even the expert informed economist will, we think, find that his grip of theory has been strengthened by their perusal. His hold on facts will, we are certain, be no less definitely confirmed; for Jevons never allowed himself to lose sight of the importance of repeated comparison of his hypotheses with actual facts, and his command of apposite examples was considerable. The attempted classification of trades put forward in one of the later chapters of this fragment shows the exhaustive pains which he voluntarily took to keep in close and full contact with concrete industrial and commercial life in all its various manifestations. In short, no reader of this treatise can, we believe, fail to feel more keenly sensible of the irreparable loss which Jevons' untimely death in 1882 brought to economic study, or to set a yet higher value

than he may have placed before on the rare combination of qualities which that famous economist possessed.

L.L.P.

Festschrift des Königlich Preussischen Statistischen Bureaus zur Jahrhundertfeier seines Bestehens. Three parts in two vols. xii + 271 pp. + viii + 151 pp., and atlas of 116 plates. Berlin: Verlag des Königlichen Statistischen Bureaus, 1905.

These stately quartos, issued to celebrate the centenary of the Prussian Statistical Bureau, form at once a record of its past history and of its present work; they should be of considerable interest to English statisticians, as giving a detailed account of the organisation and working of a centralised office such as in this country we do not possess. The first part contains the text of the history and account of the Bureau, and the second a mass of tables illustrating the statistics of Prussia; these two are bound in one volume. The third part, bound by itself, is an atlas of lithographed plates, forming graphical illustrations of the figures of Part II.

The earlier Prussian official population statistics, like the English "Bills of Mortality," appear to owe their origin to the plague. The plague was raging in 1682, and in January, 1683, the Elector Frederick William ordered a report to be made to him of the deaths, births, and marriages of the preceding year. Little progress, however, was made for a long time, and under Frederick William I the popular mistrust of statistics led to some interruption even in these simple records. It was reserved for Frederick the Great, stimulated by the publication of Süßmilch's *Göttliche Ordnung*, dedicated to him in 1741, and—may we conjecture?—by the same writer's tracts on the growth of Berlin, to undertake a much more thorough collection of official data, of so extensive a character that the true foundation of official statistics may well be assigned to his reign. It was not however till 1805 that the Statistical Bureau was founded by an edict of Frederick William III, the immediate cause being again the publication of a statistical work, viz., Leopold Krug's *Betrachtungen über den Nationalreichtum des preussischen Staates*, the author of which was duly appointed to the office, the necessity for which his work had suggested.

The mass of extraordinarily diverse material with which such a Central Statistical Bureau must deal, at one time or another, is almost appalling. To run through the list of work for which the Central Bureau is directly responsible (*Zentralisierte Arbeiten*) alone, we have the population census, registration statistics; medical statistics, including not merely the causes of death but statistics of hospitals, lunatic asylums, &c.; the occupation censuses; statistics of indebtedness and mortgages; of fires, of crops (cereals, hops and vines), of hailstorms and floods, fruit trees, forests, cattle and live-stock generally, butchers' meat, game, steam engines and boilers, boiler explosions, narrow-gauge railways, navigation, education; criminal statistics, statistics of pauperism, of unemployment, of emigration and of immigration. Under

the separate headings of "work for which other authorities are partly responsible" (*Arbeiten auf Grund behördlicher Uebersichten*) we have such matters as topographic and cartographic work; statistics of churches; of prices: limited liability companies and savings banks; of schools for orphans, cripples and first offenders; of theatres, income tax, State and local finances, and of parliamentary and other elections. Until 1886 the Meteorological Institute formed part of the Bureau. Further, since 1862 a "Seminar" ("*theoretisch-praktischen Kursus zur Ausbildung in der amtlichen Statistik*") has been held in connection with the Bureau. Apparently after the first decade of its existence the "Seminar" ceased to fulfil its intended function of training government officials, the students including a larger and larger proportion of those who had no intention of entering government service, with the result that in 1888 the character of the course was entirely altered. Government officials alone are now admitted, and that in small numbers; certain lectures are given, but a large part of the training appears to consist of actual work in the Bureau, the members of the "Seminar" not only taking part in the editing, &c., of some of the publications, but attending the sittings of the members of the Bureau and of the Central Commission—an advisory body, first created in 1860 for the purpose of unifying the statistical methods of the different authorities in Prussia. The existence of such an educational course in immediate connection with a government office seems a feature of considerable interest.

Particulars are given under each of the numerous headings we have cited as to the mode of collection of the statistics, with some details as to cost and so forth. A feature of the working on which some stress is laid is the use, wherever possible, of the *original* individual schedules in the Bureau as the basis of compilation, without copying of any kind (*die Zählkartenmethode*). The electric counting machine is not used, partly because its introduction would mean the dismissal of a large proportion of the temporary labour now employed, partly for the more adequate reason that the necessity of preparing punched cards with which to feed it would introduce a fresh source of error. The Bureau possesses some seventeen arithmometers, chiefly of the Thomas pattern, as made by Burkhardt of Glashütte; other makes, including the Burrough typewriting adding machine, being also on trial.

A complete list of the publications of the Bureau up to April, 1905, forms a very useful Appendix to the account of its work. Of the statistics in Part II little can be said in a review; they illustrate every branch of the work of the Bureau, and form a compendium of Prussian statistics that should prove particularly useful to foreigners to whom the original sources may not always be accessible. The plates of the atlas considered as samples of lithography are magnificent; the printing clear and fine, the colour-register in most plates perfect. While, however, the maps are excellent in every respect, many of the other plates suffer from the fault to which "*Festschriften*" and similar publications are particularly liable, viz., over-elaboration. There is so much

colour and so many colours, that one sighs for the sobriety of figures, or at least of plain black lines. Plate 10, illustrating the proportions of the populations of certain towns living at different distances from their place of work, and similar plates, afford examples of this fault. Possibly in consequence these plates are generally not so well printed. The present writer would also like to plead for uniformity in two respects at least: (1) that when curves or column-diagrams exhibiting variations with time are given, the time-axis should be kept horizontal and not vertical, as in Plate 19 (top); and similarly (2) that when frequency-distributions are given, the axis of the variable should be made horizontal and not vertical as in Plate 8. But these are minor criticisms. Enough has been said to show that the volumes are worth more than a passing study by British statisticians, and they should be noted by all who are likely to find themselves in difficulties with Prussian statistics, as possibly affording explanations and help. G.U.Y.

The Trade Policy of Great Britain and her Colonies since 1860. By Carl Johannes Fuchs. Translated by Constance H. M. Archibald; with a Preface by the Right Hon. J. Parker Smith, M.P. xxix + 413 pp., crown 8vo. London: Macmillan and Co., 1905.

This translation enjoys a rare, if not unique, advantage. For it introduces to the English public a pertinent contribution to a vexed discussion, which was prepared by the author, and printed in the original language, at a time sufficiently remote to guarantee a calm perspective of the bearings of the question now debated with such ardour. We may on that account be the more grateful both to translator and author that they have made no attempt to bring the survey down to date. A captious critic might indeed object, and refuse to recognise the facts and figures of twelve years ago as applicable to the immediate present, or to accept now as true the opinions then pronounced. Such a critic would however be compelled to notice, in his more candid and generous moments, that Professor Fuchs himself in the new Preface, specially written for this English version, is not at all disposed to revise the main conclusions reached in 1893 in the original German issue, in a sense at any rate which is more favourable to the prospects of this country. On the contrary, he thinks that subsequent events have lessened appreciably any serious peril with which German trade may have been really threatened by an alteration in our fiscal policy.

It is possible, indeed, that some of the particular balanced verdicts reached in many of these chapters might now have been expressed with less reserve; for Professor Fuchs holds that it is difficult to detect any very definite consequences, which can be distinctly traced to the influence of a particular fiscal policy, in the statistics of English trade which fall within the purview of his book. In the fuller light of later figures a more positive verdict might perhaps have been returned. Tendencies which had only appeared by 1893 in their dim commencement might have become by now more pronounced and manifest, and inferences and anticipations

which then seemed admissible might since have received ampler and more definite justification. At any rate, Professor Fuchs can claim the scarce but coveted privilege of being in one respect a prophet who has seen his prophecies fulfilled. For, although he ominously suggests that possibly it may be now too late, he admits in his new Preface that Mr. Chamberlain's recent advocacy of an alteration in our fiscal policy may be regarded as marking the appearance of that English statesman for whom he looked, with not much hope, who possessing the courage needed to confront the prejudice felt against new taxation of foreign food, would press upon his countrymen the need for preferential trading between the mother country and her Colonies. In fact, the careful reader of this book may be surprised to note the verbal accuracy with which the author has anticipated the leading arguments advanced by opponents of such changes.

And yet, whether he himself agree or disagree with Mr. Chamberlain's proposals, he must allow that Professor Fuchs's book is no ephemeral brochure adapted to the passing needs of a polemical debate; but is, on the contrary, a serious and comprehensive study of established facts and apparent tendencies. It has been conceived and executed in a truly scientific spirit by an expert and detached inquirer. Professor Fuchs has, it is evident, spared no pains to ascertain the movements and the characteristics of our trade, both foreign and colonial, between 1860 and 1890. He has displayed an abundant measure of that cautious deliberation, and that discriminating scrutiny, with which the trained statistician views the sparse unsatisfactory material generally available for his particular purpose, and refrains from wresting from figures more positive and large conclusions than they fairly warrant. And yet he does not attempt to conceal his mean opinion of the many serious defects which he discovers in the reasoning both of Cobden and his followers, who, he remarks, in some instances have seemed more "Cobdenite" than Cobden himself. He is fully convinced by his examination of the evidence that the commercial policy which England has pursued in the period investigated in this book has not merely done an injury more or less serious, if it be still remediable, to her relations with her Colonies, but has also, by rendering her completely powerless in later European commercial treaties, obstructed the promotion of the freer trade, which might have been secured by more vigorous and less negative and narrow conduct. Such opinions, it should be noted, are not the outcome of any *parti pris*, but are based on careful and comprehensive observation of actual recorded facts.

Professor Fuchs' own attitude of scientific detachment is not impaired by the circumstances of this translation. For, if a confirmed tariff reformer, like Mr. Parker Smith, supplies a Preface, which is for the most part an accurate summary of the successive arguments of the book, the actual translation has been made by an assistant of a Free Trader so "convinced" as Professor Smart, under his express and constant supervision. The book may therefore be confidently recommended to the study of either party

in the present fiscal controversy. The tariff reformer may perhaps rise from its perusal with the persuasion, which can hardly be declared unjustified, that Professor Fuchs has given a keener edge to some at least of the present weapons of assault directed against the old Free Trade position; for unquestionably one chief conclusion of the book agrees with the main contentions of the advocates for change in our present fiscal policy, who urge the desirability of some closer bond of union than has hitherto existed between the component portions of the British Empire, and hold that the most promising direction is being opened by preferential trading between the mother country and the Colonies. For, however indefinite be Professor Fuchs' final conclusion in the first portion of his book, he speaks with no uncertain voice in the second. The Free Trader may indeed object to the letter or even to the spirit of some of the criticisms passed on Cobden's utterances and actions in that earlier portion, and on later more bigoted developments of the Cobdenite creed and policy, although Professor Fuchs himself thinks that, when occasion suggested, this country guarded carefully its interests independently of any consistent fiscal creed. In fact, he regards the adoption of Free Trade itself as due to practical considerations. But even the Free Trader will probably allow that the reasoning of the book requires and deserves refutation. Impartial students, if such remain, who have not sworn allegiance to either side, and are not keenly interested in the current politics of the day, will feel that material essential to a fair and full decision on the merits of different fiscal systems is furnished in these chapters; and the more active politicians who yet choose to retain, in connection with the present controversy, as long as may be possible, the attitude popularly, if scornfully, described as "sitting on the fence," will, according to their inclination, welcome or repel the impulse which will be communicated, we believe, by this informed examination of the facts.

Professor Fuchs, in fine, supplies in this book a chapter of our economic history which had not hitherto been adequately written. From 1860 to 1890 he traces the trade policy, first of the United Kingdom and then of the Colonies and of the Empire, and he investigates the consequences of that policy so far as they are shown more or less clearly by trade statistics. The conclusions which he reaches are not the less significant, because the great care with which he arrives at them is plainly evident. His book accordingly belongs to that limited number which no competent student can afford to disregard; and happily it has now been made easily accessible to English students. We have no doubt that it will be read as widely and studied as attentively by the different classes of the public to whom we have referred as it deserves.

L.L.P.

Report of the Royal Commission on the Supply of Food and Raw Materials in Time of War, 1905. [Cd-2643.] Price 1s. 8d.

The report of this Commission differs from that of many Commissions, in being signed by the whole of its members, but the complexity of the subject before them is indicated by the fact that

of the seventeen signatories only three are content with the report as it stands, all the remainder adding, jointly or severally, supplementary reports, reservations, and memoranda. The minutes of evidence form a separate volume of 476 pages, and a third volume contains 356 pages of appendices, including a mass of statistical tables relating to our supplies of foodstuffs and raw materials. The statistical basis of the Commission's inquiries was laid by the Board of Trade through Mr. Llewellyn Smith, who gave evidence on three occasions, and by the Board of Agriculture through Mr. R. H. Rew, who appeared twice as representing his department, and a third time as representing the Committee of the Royal Statistical Society on the Production of Meat and Milk. Among other Fellows of this Society who tendered important evidence may be mentioned Sir John Glover, Mr. Charles Booth, and Mr. H. Birchough,

The Commission examined no less than 93 witnesses, all experts in the subjects to which their evidence related, and their report therefore embodies the best possible information as to the proportion of over-sea supplies to our total consumption as well as to the stocks of various necessary commodities. Amongst raw materials it would appear that stocks vary not only according to the conditions of the different trades, but also according to the time of year in the trades themselves. Tobacco seems to head the list, the unmanufactured stock in bond being estimated at from one to two years' supply. At the other end of the scale appears indiarubber, which is said to vary between four and eight weeks' consumption, whilst it should further be remarked, as a weakness in the position, that nearly 50 per cent. of the world's production comes from Para. It is common knowledge, too, that indiarubber has no substitute. Of foreign iron ore we have but a stock similar to that of indiarubber, but the situation here is stronger, since Britain does produce even now the larger proportion of our consumption. The stocks of other commodities vary between the limits of two months and a year. Coming to the question of foodstuffs, we have Mr. Rew's authority for the statement that 45 per cent. of our meat comes from over-sea. It may be added that whilst no less than 60 per cent. of our bacon and pork is imported, and we have but a fortnight's stock, the proportion of foreign beef and mutton is well under 40 per cent., and it is believed by experts that a month's supplies are held at the landing ports. Of milk little is imported, but over 64 per cent. of cheese and 53 per cent. of butter comes from abroad, whilst but a few weeks' stocks are retained. Of groceries which come entirely from foreign lands, coffee—which is not quite a people's commodity—is the heaviest stock, being placed at two years, whilst tea would run out in six months, and tinned provisions in half that time.

But, as the Commission tells us, wheat and flour are by far the most important articles of consumption in these islands, and accordingly we find great attention paid to the situation regarding them. Roughly, we were aware that four-fifths of our breadstuffs come from abroad. But the details now put before the public carry us a good deal further. We are reminded that whilst our

population has been growing, the acreage under wheat has decreased by one-half. Further, the imports of wheat and flour have risen from 8·61 million quarters in 1870, to 27·72 million quarters in 1904, say over 300 per cent. One satisfactory feature, and only one, does the examination of the position disclose: it is the fact that we are no longer dependent on one foreign country—the United States of America—for three-fifths of our imports, as we were a few years ago. America's own demands on her production have increased, and other sources of supply have become more prolific, and so now the origin of our wheat and flour is more widely and evenly distributed. Further, it is shown that we do not take any very large share of its production from any foreign nation, but 13·9 per cent. of their total exports coming to us from Russia in 1897-1901, and not more than 23·9 per cent. coming from Argentina. A substantial rise in price might largely increase the production of some of the exporting countries, though the fact could hardly benefit us in case of war, since if we were in difficulties the increased supply would probably come too late to be of value.

The next important point for examination was the means of transport. It is agreed that the sailing ship would not be available in time of war. But this mode of conveyance has so much declined in importance of recent years that this matters little. Eliminating from consideration those steamers which are by size unsuited for the traffic, it appears that some 6 per cent. of the deadweight tonnage of the British Mercantile Marine is always engaged in the import of grain and flour. This seems an unimportant fraction if regarded alone. But we have to remember that to bring grain cargo in, ships must go out, whether with cargo or in ballast, and there is a substantial time occupied in loading and discharge. The more informing statement therefore appears to be that 15 per cent. of the deadweight capacity is required to bring in the continuous stream of breadstuffs which, at the rate of something like thirty tons a minute, from year's end to year's end, pours into the ports of the United Kingdom. The great body of Royal Commissioners think this not a large proportion of our tonnage. But Sir H. Seton Karr points out that there are many ships constructed for special trades which could under no circumstances be used for grain traffic. Amongst these—in spite of common belief—must be included the fast mail steamers. One has heard it urged that in time of national stress such vessels as the Cunarder "*Campania*" could be employed "in running the blockade with grain." A blockade, it may be said in passing, is practically impossible, according to the naval authorities. But in any case there is other work for ships of the class referred to, and if there were not, they could not be useful as food carriers. Their deadweight capacity is almost negligible in proportion to their displacement. It may be said that they could steam slower and carry cargo in place of the coal saved by the lower horse-power to be exerted. But then they would lose their speed, which would be their chief claim to use, and would thus do inefficiently that which ships designed for the purpose do

economically. To return, the Commissioners generally are of opinion that as this 15 per cent. is spread over more than 15 per cent. of bottoms—since much foodstuff comes in general ships—the possibility of stoppage of supplies is improbable. Blockaded we cannot be whilst we have a fleet in being. Probably there is little fear of a large interference with our supplies, though undoubtedly cruisers would pick off many ships. That must be the case out of so large a fleet as that which flies the Red Ensign. But it is thought that the changes that have come in the more than forty years since the American Civil War have lessened the power of destruction of commerce destroyers, whilst it is probable that the “Alabama” and her sisters had the credit for doing injury to the United States mercantile marine which in fact was due to other causes. The general body of evidence shows that there is no probability that our ships will be laid up in time of war. That would be a shipowner’s opportunity. There would be high premiums of course, but there would also be high freights. Moreover—though we have not seen the point referred to in the blue book—there is a possible chance that those who grew foodstuffs would not wish to see their markets closed and their grain rotting on their hands when prices ranged high in this country. If our own ships could not get supplies through, such suitable vessels as there are under foreign flags might be expected to attempt to land cargoes.

Presuming always that we have a navy adequate in strength to its unprecedented responsibilities—and that presumption was a basis of the reference to the Royal Commission—it does not seem likely that a very serious shortage of grain would take place, even though it be the fact that our stocks, never exceeding seventeen weeks’ supply immediately after our harvest, run as low as six weeks’ stock at other times in the year. The probable, nay certain, danger is rise in price. Such a risk may be almost as serious as stoppage; for it is little good having a commodity at one’s doors, if one has not the means to obtain it. The purchasing power of the mass of the people would be crippled, too, by the rise in the price of raw materials. Rise in price there certainly would be. Apart from the speculative features of the case, the risk of capture would largely enhance the price. Besides, there would, and must, be a certain loss of grain ships, and we know how in a normal market a small shortage of supply runs up prices. Whilst this article was in the press the sinking of the Booth Line ss. “Cyril,” with about 190 tons of indiarubber aboard, sent up the prices from 5s. 7d. to 5s. 9d., say 3 per cent. Yet 190 tons is not a great quantity even of such a commodity as indiarubber. Speculators would undoubtedly succeed in accentuating the swing of the pendulum. The Commissioners suggest two methods by which the possibility of any very great rise in price might be obviated. The one concerns shipowners, and is devised to keep down the rate of insurance, since insurance is one of the items which eventually comes out of the pocket of the consumer. The other would tend to keep greater stocks available to our consumers, and thus to strengthen the

statistical position and prevent market causes from bringing about an undue rise. The discussion of both subjects has one feature in common: there are trade interests to be considered; "Underwriters might consider themselves unfairly treated by an interference with their legitimate profits," whilst State encouragement to hold wheat might be resented by the grain trade. The Commission does not appear to attach much importance to these points, and, indeed, it would seem an absurdity that in a matter which affects the very existence of the nation, and, perhaps, the lives of hundreds of thousands of our fellow subjects, the mere convenience, or even the profit, of a few individuals should be considered. The conclusion of the Commissioners is that, as regards national indemnity, there is a difficulty in formulating a scheme owing, on the one hand, to the danger of extravagant claims being made on the State, and to the risk of making the regulations so inelastic, on the other, that the benefit to be derived would be minimised. So strongly do they appreciate these difficulties, that they refrain from doing more than expressing a view that a scheme of some kind is desirable, whilst they add that in their view national indemnity is preferable to national insurance. The reasons for this conclusion may be briefly quoted: "National indemnity is held to be more economical than private insurance, because the country will only have to pay for actual losses," it being explained that "war premiums are an exaggerated measure of the risk run." This may be the fact; but it would be curious to know how much the market, on the whole, made out of the premiums on Vladivostock risks in the recent war. Some authorities have considered that few underwriters scored, whilst many lost heavily.

Five sets of schemes have been put forward in regard to grain storage. These resolve themselves into suggestions for (a) Government granaries, (b) inducements to traders to carry larger stocks, (c) attempts to induce owners of grain at present held abroad to keep their stocks in the United Kingdom, (d) and (e) inducements to farmers to hold their grain, and possibly to increase their production.

Mr. Marshall Stevens's scheme for free storage at Old Trafford, in connection with the Manchester Ship Canal, obtained the greatest attention from the Commission, who are decidedly against direct Government interference. They point out, however, that possibly the effect of free storage might only be to fill these warehouses at the expense of the other home granaries, without, in fact, increasing the national stock!

The report therefore will be found to assemble the reliable information upon which a conclusion in this essential matter must be based. It tells us that in the present state of the relation of our supplies to our needs, something beyond an adequate navy is necessary to the country. It suggests that, without loss of time, a committee of qualified persons should endeavour to formulate a satisfactory scheme for national indemnity, and that an experiment in grain storage should at once be tried, and if successful, followed up in a large way. There are, as already indicated,

several minority reports. Professor Holland thinks the views of his colleagues too optimistic. The Duke of Sutherland, Mr. Chaplin, Mr. Wharton, Sir H. Seton-Karr, Mr. Cunynghame and Professor Holland, for example, think the conclusions regarding shipping too rosy, whilst the first five Commissioners named are "not content with the conclusions and rather vague proposals recommended in the report." "Agreeing with them as far as they go, they wish to put on record their view of the causes which have led to our present situation, and the remedies which they believe adequate and essential to the position." They believe that Mr. Marshall Stevens's scheme is inadequate, and suggest the imposition of a moderate duty on imported grain and flour—"one or two shillings a quarter"—if the produce goes direct into consumption. To induce storage they suggest that, if held in bond for a time, the duty should gradually be taken off, so that if the grain or flour were stored for, say, four months, it should come in free. This they believe would cost the country little, and would effect the purpose which the main body of Commissioners consider essential.

The whole report, as it is hoped may have been indicated in this imperfect notice, is full of information on important subjects—crammed with points which make one think. B.W.G.

Report to the Board of Trade on the North-West of Canada, with special reference to Wheat Production for Export. By James Mavor, Professor of Political Economy in the University of Toronto. London: Eyre and Spottiswoode, 1905. [Cd-2628.] Price 5s. 5d.

In speaking of this "report," one can hardly escape from a certain hackneyed, but, in this case, most appropriate, phrase. It contains "a mine of information." An older-fashioned scholarship than that of Toronto might have preferred to have the "report proper," followed by excursus on subjects arising naturally out of the report. But really it does not much matter, the whole document being singularly readable and replete with information. It is worth mentioning that in a Blue Book "devoted mainly to wheat production" will be found the best, fullest, and most dispassionate account yet penned of that strange communistic fraternity the Doukhobors, and that probably no future "Dictionary of Sects and Heresies" will be complete without full quotation from the history of the Menmonites as given in the same report to the Board of Trade. It is interesting also to note how these somewhat considerable digressions, as they might otherwise be deemed, arise in the most natural manner out of Mr. Mavor's theme. The Doukhobors, living under individualistic laws, have so many homesteads allotted to so many settlers in severalty. Pooling these allotments by voluntary arrangement, they are enabled to get home cultivation attended to by, say, 800 out of every 1,000 homestead owners. This leaves 200—these numbers, of course, make no pretence to precision—or 20 per cent. of the younger and sturdier settlers to go afield as agricultural labourers, particularly in harvest, when high wages are to be earned. The money brought home by these

labourers is, after paying all expenses, quite considerable, and provides the Doukhobor community with many external luxuries. One of these is the telephone, which, fitted up between remote homesteads, relieves the feeling of nostalgia, and makes greatly for the sociability and happiness of connected families. These gentle Tolstoyans do not grow much wheat for export, but they have largely increased the Canadian production of flax. They use the fibre for making clothes, and they have the oilseed to sell. The Mennonites are good agriculturists, and while their quietism forbids their taking any part in Imperial or local politics, they run a journal with the joint objects of promoting agricultural knowledge and defending the religious interests of the Mennonite sect. The Doukhobors are, of course, Slavs; the Mennonites are, for the most part, of Teutonic descent.

Coming to what may be termed the report itself, it will be found that Professor Mavor is a cautious and prudent critic of the twenty-three years' progress which more particularly falls within his scope. "It may be said" is his favourite formula, and he leaves some of his most important statistics to be their own interpreters. The sixty-first of his foolscap pages is a mass of figures printed in small type, and containing an enormous amount of information about Manitoba from the beginning of 1883 to the close of last year. The advance made in cereal cultivation in that period is greater than the average reader will have imagined. Wheat culture has increased tenfold, barley culture sixfold, that of oats fourfold. Manitoba advance has had its breaks and ebbs. Evidently 1896 was a year of great discouragement, and 1900 was also a black year. On the other hand, really striking advances were made in 1891, 1898, 1901, and in 1903.

The table of crop yields from 1883 to 1904 inclusive, is striking in itself. When it is made the subject of reflection in its various bearings, it may even be called startling. Wheat production fluctuates from 8 to 28 bushels per acre, barley production from 13 to 37 bushels, and that of oats from 16 to 49 bushels. It does not seem much good to average the figures, for that farmers can live through times of prosperity is "a glimpse into the obvious," and no averaging will enable the man without resources to "wait till the clouds roll by." It is true that 1887 gave 25.7 bushels of wheat to the acre, and that this bonus of say 5.7 bushels made it practicable to live through 1888 with 16.2 bushels yielded. But, how did even the sturdy and enduring agriculturist manage to survive 1889 when the short year, 1888, was followed by a crop of only 12.4 bushels? Again, the disastrous crop of 1900, which was only 8.9 bushels, followed four years in none of which were 20 bushels grown. It is true that 1901 grew 25.1 bushels, and 1902, 26 bushels, but it is on the weathering of the previous storm that the agricultural economist needs to concentrate his attention. This soulless page of statistics is, in reality, eloquent of great patience, great endurance, great thrift. It speaks whole volumes for the manliness of the settlers, for their doggedness, for their perseverance. Nor can the English race claim an exclusive right to this praise.

Manitoba, as the useful "racial map" given in the report shows, has been the settlement of many peoples. May it be remarked in passing that in future "racial maps" cross-divisions should be avoided? Here we have "Scandinavians" coloured one tint and "Nestorians" another. No harm has yet been done, but suppose a Scandinavian were to become a Nestorian? For the latter term denotes a religion, a species of premature Protestantism. Its present holders are mostly Syrians.

The great agricultural territories lying to the north-west of Manitoba are in area about three times that of Great Britain, and they are divided into sixteen sections or counties. They devote 1,055,282 acres to wheat, 112,090 acres to barley, 656,229 acres to oats, and 20,938 acres to flax. Unlike Manitoba, where wheat has made the most progress, the north-west has increased its barley area sevenfold and its area of oats sixfold, while wheat cultivation has increased threefold (p. 63). Considerable attention is given in the report to large tracts of semi-arid land within the vast Dominion. If the price of wheat in Europe remains low—let us say under 30s. per quarter—it will never pay to exploit this area. But an advance in the price of wheat would greatly alter this. The Chilean and also Australian farmers, I may add, succeed already in growing wheat on areas which this report calls "semi-arid," *i.e.*, where the average rainfall is only 14 to 15 inches.

The climate of the Canadian north-west shows more variety than had been imagined, and the cultivation of autumn-sown wheat, once held to be impossible, is spreading rather fast in the region immediately east of the Rocky Mountains. But for the most part the regions dealt with in the report have a single month of spring (April), a single month of autumn (October), and all the rest is either summer or winter. The Manitoba May is as hot as July, and so is September. The mean *highest* temperature of March at Winnipeg is only 24°. At Edmonton, far away to the north-west, a mild March day may show a temperature 2° above freezing; in other words, there may be a thaw. November in Manitoba is absolute winter, the glass falling to 22° of frost after sundown and only rising to 27° at noon. Manitoba, without suffering drought, has a decidedly dry climate. The mean rainfall is 16.73 inches. All over Canada the records of bright sunshine are magnificent. A very fine year in England has 1,400 hours bright sunshine; the *average* at Winnipeg is 2,176 hours! The winter is more than three times as sunny as ours. Wheat-sowing begins in an early year in the first week of April (p. 7), but may be postponed as late as the 25th. Hay is generally ready for the scythe by the third week of July, and wheat is cut from the 4th to the 22nd August. Mr. R. F. Stupart of Ottawa, Mr. T. C. Chamberlin of Chicago, and Dr. Kennedy of Alberta have supplied Professor Mavor with important details of temperature, sunshine, and rainfall.

The "elevators," which play so large a part in Canadian crop storage, &c., are the subject of a useful investigation (p. 109). Their present capacity is about 46,000,000 bushels; in addition, the Grand Trunk Pacific Railway promise to construct a large

terminal elevator system, and no doubt country elevators will gradually spring up along the line proposed to be constructed.

The cost of wheat production in Manitoba and the north-west is not easily ascertained, and the report must be referred to *passim* in order to form any just idea. Probably 5*d.* for 12 lb. of grain will pay the grower of corn in the remote north-west, but the price made by the farmer at the elevator depends upon how the wheat grades, and parts of the report which deal specifically with average price would mislead if they were read without reference to at least one other passage, which explains the severe trial to farmers of a year when the wheat does not grade well. There are generally speaking three grades, Nos. 1, 2 and 3, and in ordinary years the proportion of the three grades will be such that if 18*s.*, 17*s.* and 16*s.* per quarter (480 lb.) be paid at the elevator or grading granary for the three types, the price of 17*s.* per quarter may safely be averaged for the crop. There come, however, years when though the yield to the acre may be adequate, the grain seldom reaches No. 3 grade. In that case the elevators cannot receive it, and the farmer is left with a marketless product. It is clear that we cannot quite isolate the question of "wheat production for export." Feeding use for wheat below No. 3 grade has evidently to be considered, especially as the Canadian grading runs rather high. Thus at the "Baltic" 29*s.* 6*d.* per quarter is now paid for November shipment of No. 3 Manitoba wheat, whereas the London average for English wheat on the same day (I have taken 12th September) was 27*s.* 11*d.* only.

With respect to the existing state of affairs it is satisfactory to note that the recent wheat crop in Manitoba and the north-west is not only a good one, but that the above "Baltic" price of 29*s.* 6*d.* for No. 3 grade appears to promise decidedly profitable sales.

An interesting forecast made by Mr. Mackellar (Assistant Minister of Agriculture, Manitoba) is worked out on the basis of the figures for twenty-three years supplied by Professor Mavor in the report itself. According to this forecast (p. 122) Manitoba in 1914 will be producing 21,000,000 quarters of wheat, over 2,700,000 quarters of barley, and 11,580,000 quarters of oats, which should allow of at least 15,000,000 quarters of wheat and 7,000,000 quarters of oats being shipped to the United Kingdom. With reference to barley exports Mr. Mavor has some very shrewd remarks. The question, as he perceives, is not one of feeding stuffs only, beer is largely drunk in the Dominion, and apparently the malting barley has to be imported for the most part. This is not good economy, the grower of barley in Manitoba and elsewhere within the Dominion should aim at malting quality and home demand, not at growing 400 lb. stuff for export.

Dr. Saunders estimates the Canadian Dominion to have 166,000,000 acres of land on which wheat could be grown and is not grown (p. 120). If these figures be at all accurate (and the "climatic" portion of Mr. Mavor's report does not discountenance the idea) it may easily be admitted that our nearest colony, within a week's steamship journey of our shores, could

in case of emergency supply the United Kingdom with all its wheat requirements. C.K.-J.

Royal Commission on London Traffic. Vol. i. Report of the Commission. [Cd-2597.] 1905. Price 3s. 3d.

This is divided into three parts. The first portion deals with the magnitude of the problem of locomotion in London, the difficulties in the way of improving the means of locomotion, and the attempts which have been made to ameliorate the conditions. The fact that the area of Greater London is nearly 700 square miles, with a population of over 6½ million persons, each of whom, on the average, it is estimated, makes 200 journeys yearly, gives some idea of the magnitude of the problem. There is a suggestive table on page 8, showing the time lost daily by delays in holding up cross traffic, which should appeal in a special manner to a business people, with whom time is money.

The housing question, which is intimately connected with any proposals for lessening the crush in the streets, is carefully examined by the Commission. They find that the efforts of the London County Council to deal with the question by building workmen's dwellings have resulted generally in loss to the rate-payers when the dwellings were erected in central districts; but that there was no such loss to speak of when the dwellings were put up in the suburbs. The disappointing fact is, however, that the people actually displaced by improvements do not occupy the new houses built for them. The Commission do not appear to have considered the question of the decentralisation of certain industries carried on in London, many of which are no doubt capable of being conducted elsewhere under cheaper and better conditions, as has been already shown in many well-known instances.

The second part of the report deals with the necessary improvement in the means of locomotion and transport in London, and contains the recommendations of the Commission on this point, which may be classed under the heads of:—street improvement, tramways, railways and traffic regulations, &c. As regards the improvement and widening of thoroughfares, the great difficulty is the enormous cost, owing to the value of land in London. The Commission recommend a preference to such street improvements as would facilitate the extension of the tramway system. They consider the provision of tramways to be quite insufficient, while the absence of through communication between the different existing systems detracts from their usefulness. As regards railways the Commission are of opinion that when the tube railways already authorised are completed, railway communication within the central area will be fairly adequate. In the suburbs, however, there is a necessity for further north-east and east and west railway facilities, and they also are of opinion that where shallow railways can be satisfactorily employed in London, they are preferable to the tube railways. In regard to workmen's trains, the Commission do not think railway companies should be compelled to run trains at a loss, but that it would be an advantage

if local authorities could in some cases co-operate with the railway companies for the running of cheap trains for limited periods.

A number of practical recommendations as to traffic regulation are made by the Commission.

The third portion of the report deals with the suggested establishment of a Traffic Board, and defines what its powers and duties should be. One of them, and perhaps the most important, would be the preliminary examination before submission to Parliament, of Bills seeking powers for construction or extension of works affecting the means of locomotion and transport in Greater London. The report is signed by all the members of the Commission, except Sir George C. T. Bartley, who thinks that the report does not adequately meet the great questions involved, although a comparison of his dissenting note with the report shows that he is largely in accord with most of the findings of the majority. The report contains a very full table of contents and also a good index, besides giving a summary of the contents of the seven volumes still to be published, an innovation which might well be copied in other reports of Royal Commissions. J.P.M.

Agricultural Statistics, 1904. [Cd-2594.] Price 1s. 5d.

This annual volume, in which the Board of Agriculture combine the returns of the acreage and produce of crops and the number of live stock in Great Britain, which have been previously published, with a mass of other statistical information relating to British and foreign agriculture, was issued in June last. Very considerable additions have been made this year to the statistics of the current prices of agricultural products obtained by the new system of weekly market reports which the Board now collect from many important centres.

The report by Major Craigie, which prefaces the 284 pages of tabular matter contained in the volume, calls attention to many points of interest. For example, the ever-present subject of the sources of our over-sea supplies of breadstuffs is neatly summarised in the following table, which gives the percentage of our total wheat imports, including flour in its equivalent in grain, received from various countries, in the past five years:—

Country.	1900.	1901.	1902.	1903.	1904.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Argentina	19·0	8·2	4·2	12·2	18·5
Roumania.....	0·8	0·5	2·2	2·7	1·3
Russia	4·6	2·5	6·1	14·8	20·1
United States	58·2	66·2	60·2	40·0	15·7
Other foreign countries	5·1	3·3	3·7	3·3	5·2
Total foreign countries ...	87·7	80·7	76·4	73·0	60·8
Australia	3·0	6·1	3·9	—	9·6
Canada	8·1	8·5	11·3	12·4	7·6
India	—	3·3	8·2	14·6	21·6
Other British possessions	1·2	1·4	0·2	—	0·4
Total British possessions	12·3	19·3	23·6	27·0	39·2

Major Craigie observes :—"The chief feature in the grain trade of 1904 has been the failure of the United States to furnish us with more than a very small portion of our wheat. But notwithstanding the remarkable restriction of the supplies from this quarter, the aggregate amount (including wheat flour expressed as grain) from all countries exceeded even the unprecedentedly large receipts of 1903. Out of the great total of over 118,000,000 cwt., the United States supplied only 18,500,000 cwt., thus losing for the first time the pre-eminence that it has occupied in this respect for so many years, and occupying only the fourth place among the contributories of the year. The first place was taken by India, whence we derived 25,500,000 cwt., but this was closely followed by Russia's contribution of 23,700,000 cwt., and by that of Argentina, which reached 21,800,000 cwt."

The comments on Colonial and Foreign statistics of agriculture possess timely interest in view of the International Statistical Congress which was imminent when this volume was published. Major Craigie deals with the figures relating to the world's wheat production in a novel manner, by grouping them "under three national flags," Russian, British and American, which "furnish quite two-thirds of the aggregate wheat area accounted for in the official returns of different countries. This gives the following comparison :—

States	Area under Wheat.	Estimated Production.	Yield per Acre.
	Acres.	Quarters.	Bushels.
Russian Empire	57,000,000	77,000,000	10·8
United States of America	44,000,000	67,000,000	12·1
British Empire	40,000,000	69,000,000	13·8

The qualifications to be borne in mind in making this comparison are considered, and Major Craigie continues : "Nowhere for an area of equal size is so high a yield obtained as in Great Britain herself with a return of 31 bushels per acre over the last ten years. But in an Imperial average we have to count with the meagre yield of our Australian colonies and of some parts of India, where the wheat production may fall to 7 bushels to the acre, while similar low estimates for Russian Siberia and for the Southern States of the American Union leave their mark on the average in each case. With narrower areas higher average yields are obtainable, and the next largest group of wheat-growing States may be said to be formed as under, crediting to France—as in the case of Russia and of the British Empire—her non-European wheatfields in Algeria":—

States	Area under Wheat.	Estimated Production.	Yield per Acre
	Acres.	Quarters.	Busbels.
France, with Algeria	19,000,000	39,000,000	16
Italy	12,700,000	18,000,000	11
Austria-Hungary	11,800,000	28,000,000	19
Argentina	10,700,000	16,000,000	12
Spain	9,000,000	17,000,000	15
Germany	4,700,000	17,000,000	30
Roumania	4,300,000	6,500,000	12

As regards live stock also, some interesting international comparisons are given, but the difficulty of obtaining returns for recent years is referred to. Taking, however, in each case the last available year of the five 1900-04, the following statement is given for the five States, which account for three-fourths of the cattle and more than two-thirds of the sheep shown in the official live stock returns of Europe:—

States.	Population. Number	Surface. Acres.	Cattle. Number.	Sheep. Number.
	Millions.	Millions	Millions.	Millions.
Russia in Europe.....	105	1,276	33·2	47·5
Germany	58	134	18·9	9·7
United Kingdom	43	78	11·6	29·1
France	39	130	14·1	18·0
Austria	26	74	9·5	2·6

The density of the herds and flocks in each of these cases in relation both to total area and population, works out as under:—

States.	Per 1 000 Persons.		Per 1,000 Acres of Surface.	
	Cattle	Sheep.	Cattle.	Sheep.
Russia in Europe.....	316	451	26	37
Germany	326	168	142	73
United Kingdom.....	270	677	148	374
France	362	461	108	137
Austria	365	100	128	35

Thus stated, the report makes it clear that the United Kingdom, in proportion to population, owns fewer cattle but very many more sheep than its larger European neighbours. Despite the rare use of cattle here for agricultural labour compared with the practice of other European States, the herds maintained by the British agricultural system show a greater density per acre of surface than that displayed in Germany, where cattle have so lately been largely augmented as the stocks of sheep have declined. On the continent indeed the last feature—the diminution of sheep—is shown to be

perhaps the most remarkable of the agricultural movements of recent years, and although experienced here, it is much less evident in this country than elsewhere, while neither in the United States nor in Australasia do the latest data suggest those developments which were at one time expected to balance the losses in the flocks of the Old World.

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Annals of the American Academy of Political and Social Science. July, 1905—Contains series of papers dealing with the subject of the United States as a World Power.

Journal of Political Economy. June, 1905—The wages of unskilled labour in the United States, 1850-1900: *Edith Abbott*. The Source of Financial Power: *W. G. Langworthy Taylor*. Marginal Utility and Exchange Value: *R. S. Pulan*. History of the Working Classes in France: *A. M. Wergeland*. The Industrial Capacity of the German: *Earl Dean Howard*. Credit and Prices: *Thorsten Veblen*.

Political Science Quarterly. June, 1905—The Anomaly of our National Convention: *Alfred P. Dennis*. The Rigid Constitution: *Henry B. Higgins*. The Political Philosophy of John Locke: *William A. Dunning*. The Field of Economic Dynamics: *John B. Clark*. The Economic Cost of Slave-Holding: *Ulrich B. Phillips*. Immigration to the Southern States: *Walter L. Fleming*. The Sewage Farms of Berlin: *Robert C. Brooks*. Record of Political Events: *Charles Beard* and *A. S. Johnson*.

Quarterly Journal of Economics. August, 1905—The Co-operative Coopers of Minneapolis: *G. O. Virtue*. The Probable Increase of the Negro Race in the United States: *Walter F. Willcox*. Suggestions on the Theory of Value: *Ludwig Kotany*. The Establishment of the Gold Exchange Standard in the Philippines: *E. W. Kemmerer*. Wool-growing and the Tariff since 1890: *Chester W. Wright*. The Hibernia Fiasco—Recent Effort of the Prussian Fiscus to acquire Coal Lands: *Francis Walker*.

Quarterly Publications of the American Statistical Association. June, 1905—Methods of Measuring the Concentration of Wealth: *M. O. Lorenz*. Homicide in New Hampshire: *Harry G. Nutt*.

Yale Review. August, 1905—The Secret of Autocracy; the Absolutism of the Czar: *Alfred P. Dennis*. The Industrial Progress of Germany, II: *Werner Sombart*. Disfranchisement in West Virginia, II: *Charles H. Ambler*. Federal Activity in the Interests of the Public Health: *James Wilford Garner*.

Monthly Summary of Commerce and Finance, 1905—

May—Commercial Cuba in 1905. Customs Tariff of Newfoundland. Alien Arrivals in the United States.

June—Customs Tariffs of United Kingdom and British Possessions in Europe. Customs Tariffs of British West Indies.

UNITED STATES—*Contd.*

Bulletin of the Bureau of Labor, 1905—

March—Course of Wholesale Prices, 1890-1904. Street Railway Employment in the United States: *Walter E. Weyl*. State Co-operative Accident Insurance Fund of Maryland.

May—Labor Conditions in the Philippines. Labor Conditions in Java: *Victor S. Clark*. The new Russian Workingmen's Compensation Act: *I. M. Rubinow*.

AUSTRIA—

Statistische Monatschrift, 1905—

June—July—Die weibliche Bevölkerung in Österreich und deren Fruchtbarkeitsziffer: *Dr. Presl*. Der Arbeits- und Kostenaufwand der Volkszählung vom 31. Dezember, 1900: *Meinzingen*. Forst- und Jagdstatistik für das Jahr 1903. Österreichs Sparkassen im Jahre 1903: *H. Ehrenberger*. Beiträge zur Statistik der Seefischerei in den wichtigsten Staaten Europas: *Dr. v. Monllong*. Beiträge zur Statistik der Binnenfischerei in Österreich und einigen anderen Staaten: *R. Günther*. Die Zwangsversteigerungen von Liegenschaften in den Jahren 1902 und 1903: *Dr. v. Zwiédineck-Schidlo*.

August—Die erbliche Belastung als Erkrankungsursache der Irren: *Franz v. Meinzingen*. Studentenfürsorge im Jahre 1904: *Alfred Lorenz*. Österreichisch-ungarischer und deutscher Aussenhandel, 1891-1903.

FRANCE—

Annales des Sciences Politiques, July, 1905—La crise de l'apprentissage: *Georges Alfassa*. Le rachat des chemins de fer en Suisse (fin): *L.-Paul Henry*. En Tunisie: les mines et le nouveau réseau ferré: *Henri Lorin*. La Conférence de Berne du 8 juin, 1905, et la législation internationale du travail: *H.-E. Barrault*. L'avenir économique du Japon (fin): *Achille Viallate*. Chronique coloniale (1904): *Ch. Mourey*.

Journal des Economistes, 1905—

July—La Confession de M. Méline: *Yves Guyot*. Le contrôle et la surveillance des compagnies d'assurance sur la vie: *Eugène Rochefin*. Les halles centrales: *E. Letourneur*. Mouvement financier et commercial: *Maurice Zablet*. La falsification des denrées alimentaires et sa répression: *Daniel Bellet*.

August—Les résultats du droit sur le blé en Italie: *Edouard Giretti*. La lutte contre le chômage en Suisse: *Daniel Bellet*. L'entrepôt obligatoire et les nouvelles mesures fiscales à Paris: *E. Letourneur*. John Parish, Banquier et Négociant à Hambourg: *A. Raffalovich*. La proposition Morel et la Rubanerie: *Paul Olivier-Lacroix*. Les Comités d'ouvriers en Allemagne: *Richard Boret*.

Journal de la Société de Statistique de Paris, 1905—

July—Contributions statistiques à la connaissance de la fécondité légitime (d'après les recherches de M. A. N. Kiaer): *J. Bertillon*.

FRANCE—*Contd.*

Journal de la Société de Statistique de Paris, 1905—*Contd.*

August—Comparaison numérique de courbes statistiques (à suivre): *L. March*. La session de Londres de l'Institut international de Statistique: *A. Neymarck*.

La Réforme Sociale, 1905—

No. 12—Associations Coopératives de production agricole dans les Alpes Maritimes: *Louis Rivière*. Les grèves agricoles du Midi, leurs causes et leurs remèdes: *Félix Bouffet*. Les églises et l'État aux États-Unis: *Valentin Brifaut*. Les colonies de vacances pour les enfants chétifs et pauvres (premier article): *Eugène Plantet*.

Nos. 13—14—Les familles françaises et les carrières commerciales et industrielles: *Auguste Isaac*. Le devoir social et la formation sociale du patron: *E. Cheysson*.

Nos. 15—16—L'enseignement professionnel et ménager des filles aux xvii^e et xviii^e siècles: *Albert Babeau*. Les crises belliqueuses du peuple anglais—l'évolution des facteurs sociaux: *Jacques Bardoux*. La formation des chefs d'industrie: *Colonel Arnould*. Annales de la charité et de la prévoyance—Rapport sur les travaux de l'Office central des Oeuvres de Bienfaisance pendant l'année 1905: *Brueyre*. Deux organisateurs de la charité sous l'ancien régime: Théophraste Renaudot et Piarron de Chamousset: *Louis Rivière*. Le Centenaire de Le Play. Le Congrès des syndicats agricoles de Périgueux et les questions féministes.

Revue d'Economie Politique, 1905—

June—Les illusions relatives aux retraites ouvrières: *Edmond Villey*. Quesnay et le tableau économique: *Gustave Schelle*. L'assurance contre les accidents du travail en Angleterre. État actuel de la question. Assurance facultative ou assurance obligatoire: *A. Monnier*. Chronique ouvrière: *Ch. Rist*.

July—L'économie politique au Conservatoire des Arts et Métiers: *E. Lerasseur*. L'Institut international d'Agriculture proposé par S.M. le Roi d'Italie: *Richard Dalla-Volta*. Notes sur l'Italie: *G. François*. Chronique des transports et travaux publics: *Marcel Porte*.

GERMANY—

Archiv für Rassen- und Gesellschafts-Biologie, July—August, 1905—

Ist Weismann widerlegt?: *E. Müller de la Fuente*. Die Familie Zero: *J. Jorger*. Zur Kritik des Rassenproblems: *L. Kuhlentbeck*.

Archiv für Sozialwissenschaft und Sozialpolitik. 1905—

Band 21, Heft 1—Die protestantische Ethik und der "Geist" der Kapitalismus. 2. Die Berufsidee des asketischen Protestantismus: *Max Weber*. Kritik des Sparkassenwesens deutscher Selbstverwaltungskörper. Kritik des Scherlschen Prämien-Sparsystems: *Robert Schackner*. Die preussischen Berggesetznovellen: *Georg Golthein*. Studien zur Entwicklungsgeschichte des nordamerikanischen Proletariats. 1. Einleitung: *Werner Sombart*.

GERMANY—*Contd.*

Archiv für Sozialwissenschaft und Sozialpolitik, 1905—*Contd.*

Heft 2—Sozialpathologie als Wissenschaft: *Willy Hellpach*. Studien zur Entwicklungsgeschichte des nordamerikanischen Proletariats. 2. Die politische Stellung des Arbeiters: *Werner Sombart*. Proletariat und Bourgeoisie in der sozialistischen Bewegung Italiens. Studien zu einer Klassen- und Berufsanalyse des Sozialismus in Italien: *Robert Michels*. Die Konzentration im Kohlenbergbau und das preussische Berggesetz: *Eberhard Golthein*. Die Rechtslage der Gewerksvereine in den Vereinigten Staaten: *J. H. Ralston*. Die sozialpädagogischen Ziele und Erfolge der Comenius-Gesellschaft: *Ludwig Keller*.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft (Schmolter's) Heft 3, 1905—Beiträge zur Frage nach der Produktivität der Arbeit und der Bevölkerungsverteilung auf die verschiedenen Erwerbszweige. 1. Die Produktivität der Arbeit in der Landwirtschaft: *Carl Bullocl*. Die Frühpolizeistunde im Deutschen Reich: *Dr. Olshausen-Hamburg*. Die Einführung der Schutzdekrete unter Karl VI. in Wien: *Karl Pribram*. Zur Geschichte der Württembergischen Vereinsbank: *Kilian Steiner*. Die Verwaltungskosten der Berliner Grossbanken. 2: *Rudolph Steinbach*. Staatsaufsicht über die Hypothekenbanken. 1: *Michael Golodelz*. Die hessische wirtschaftspolitische Gesetzgebung im Jahre 1902 und ihre bisherigen Erfolge (insbes. die Landeshypothekenbank und die Pflege des Kleinwohnungsbaus): *W. Troeltsch*. Die Entstehung der grossen bürgerlichen Vermögen im Mittelalter: *Rudolf Hapke*. Eugenik: *Ferdinand Tönnies*. Kleinhaus und Mietkaserne: *Gustav Seibt*. Tatsächliche Berichtigungen zu der Schrift von Andreas Voigt und Paul Geldner "Kleinhaus und Mietkaserne": *R. Eberstadt*. Germain Garnier als erster Aufsteller der Abstinenztheorie: *W. Hasbach*. *Jahrbücher für Nationalökonomie und Statistik*, 1905—

June—Fallende und steigende Stücklohnsätze: *W. Hasbach*. Beitrag zur Theorie des wirtschaftlichen Wertes: *Theodor Ginger*. Die wirtschaftliche Gesetzgebung Italiens in den Jahren 1903 und 1904: *Constantino Bresciani*. Zur Geschichte der Kreditgenossenschaften Japans: *Heinrich Pudor*. Die Landarbeiterfürsorge und das Genossenschaftswesen in Norwegen: *Heinrich Pudor*. Die Kapitelstaxen in Dänemark: *Henrik Pedersen*. Die Verwandlung von Kopffzahlen in Konsumeinheiten: *Nikolaus Kazmány*. Die Ergebnisse der österreichischen Kriminalstatistik in den letzten Jahren: *Franz Doehrer*. Die Internationale Agrarkammer: *Richard von Arkoëy*. Die Danziger Holzarbeiter: *Käthe Schirmacher*.

July—Der englische Zensus vom 1 April, 1901. Vorgeschichte, Methode und Ergebnisse: *Otto Mosl*. Die deutsche Börsensteuer und die Versuche ihrer Umgestaltung: *Otto Warschauer*. Die Arbeiterschutznovelle zum preussischen Berggesetz: *Moritz Wagner*. Die beruflichen Verhältnisse der italienischen Bevölkerung nach den Ergebnissen der Volkszählung von 1901: *Heinrich Hauke*.

GERMANY—Contd.

Jahrbücher für Nationalökonomie und Statistik, 1905—Contd.

August—Die "enorme Ueberbilanz" der Vereinigten Staaten; *Heinrich Dietzel*. Die wirtschaftliche Gesetzgebung der deutschen Bundesstaaten im Jahre 1904: *Albert Hesse*. Fürsorgeeinrichtung für die Angestellten der Zentrale für Spiritusverwertung, Gesellschaft mit beschränkter Haftung. Studien über den Pariser Getreidhandel. Die Monatspreise des Getreides in Paris unter dem Einfluss der Börse: *Hans L. Rudloff*.

Zeitschrift für Sozialwissenschaft, 1905—

Heft 6—Mitteleuropäische Rechtsangleichung: *Ludwig Fuhl*. Zwanzig Jahre Kriminalstatistik: *Paul Franenstädt*. Die neuere Agrargesetzgebung in Livland, mit Ausblicken auf Agrargesetzgebung und Agrarverhältnisse in Deutschland. II: *Karl v. Saunson-Himmelsjerna*. Der gerechte Lohn: *Friedr. Kleinwächter*.

Heft 7—Die Deportation, die Gesellschaft und das Verbrechen: *Max Treu*. Ein Arbeiterleben: *Gustav v. Rohden*. Zur historischen Bevölkerungsstatistik der Stadt Breslau: *Adolf Nglisch*. Die neuere Agrargesetzgebung in Livland, mit Ausblicken auf Agrargesetzgebung und Agrarverhältnisse in Deutschland. III (Schluss): *Karl v. Saunson-Himmelsjerna*.

Heft 8 und 9—Der Raum als Weltbeherrscher: *Wilhelm Schaefer*. Über Unterricht und Erziehung von sozial-hygienischen und sozial-anthropologischen Standpunkt: *Ferdinand Hueppe*. Zur Vagabundenfrage: *G. von Rohden*. Der zollfreie Veredlungsverkehr in Österreich-Ungarn und der Schweiz. 1: *F. Lusensky*.

Zeitschrift für die gesamte Staatswissenschaft. Heft 3, 1905—Die Entwicklung der Selbstverwaltung Frankreichs im 19. Jahrhundert (Schluss): *H. L. Rudloff*. Untersuchungen über den Gesellschaftsbegriff zur Einleitung in die Soziologie: *O. Spann*. Die Wirkungen der deutschen Börsensteuergesetzgebung: *W. Gerlach*. Zahlenrechtes Wählen: *A. Tecklenburg*. Zur Frage einer Wohnungsstatistik in Verbindung mit der nächsten Volkszählung: *A. Zurchorst*. 25 Jahre Fabrikinspektion: *Dr. v. Zwiédineck-Südeuhorst*.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. July, 1905—Neuere Sterblichkeitsuntersuchungen an Versicherten: *E. Czuber*. Die Versicherung auf Gegenseitigkeit in England: *Edmund Friedeberg*. Arbeiterversicherung und Volksgesundheit: *Alwin Bielefeldt*. Der französische Gesetzentwurf über den Versicherungsvertrag: *Cosmao-Damanoir* und *Roman Fachini*. Die Sterblichkeit in den Berufen, die sich mit der Herstellung und dem Verkauf geistiger Getränke befassen: *Albert Andrau*. Die Kreditversicherung: *C. G. Molt*.

Vierteljahrshefte zur Statistik des Deutschen Reichs. Heft 3, 1905—Dampfkessel-Explosionen, 1904. Zoll- und Steuer-Straffälle, 1904. Zollbegünstigungen der Weinändler, 1904. Spielkarten-Fabrikation und -Versteuerung, 1904. Schaumwein-Erzeugung und -Besteuerung, 1904. Tabakbau und Tabakernte, 1904.

ITALY—

Giornale degli Economisti, 1905—

June—Un punto nero nella legge sull' esercizio ferroviario di Stato: *A. Contento*. Una pagina storica dell' organizzazione dei contadini lo sciopero del II Mandamento di Mantova: *N. Mazzoni*. Monografie di famiglie agricole del comune di Mores (Provincia di Sassari): *L. Camboni*. Le entrate del Comune di Roma ed il loro naturale incremento: *L. Nina*. Storia giuridica e storia economica: *F. Giuffrida*.

July—L' azione del comune per le case popolari: *U. Gobbi*. Capitali personali e valore economico degli emigranti: *A. Beneduce*. L' espansione economica e coloniale della Germania: *M. Fauno*. Il nuovo disegno di legge sull' esercizio delle operazioni di assicurazioni: *R. Della Fede*. Il panificio municipale di Catania: *P. Cicero*.

August—Dell' influenza delle condizioni economiche sulla forma della curva dei redditi: *C. Bresciani*. La politica delle libere importazioni: *E. Girelli*. L' azione del comune per le case popolari: *U. Gobbi*. Le condizioni del salariato agricolo in Provincia di Cagliari: *A. Peiraleri*. Ancora del costo di produzione dell' uomo e del valore economico degli emigranti: *F. Coletti*.

La Riforma Sociale, 1905—

June—La riforma della tariffa postale in Italia: *Gastone Cavalieri*. La sila di Calabria: *Michele Bernardelli*. Di alcuni indici del movimento economico in Italia: *Spectator*. I viticoltori e il dazio sul grano: *F. Coletti* and *A. Aducco*. La riforma dei tributi locali specialmente in rapporto alle provincie: *Luigi Giordano*.

July—Politica doganale: *Rodolfo Benini*. La municipalizzazione del pane: *F. G. Tenerelli*. Il bilancio dell' emigrazione: *F. S. Nitti*. Un trentennio di vite di una grande società industriale Italiana: *Spectator*. Le abitazioni popolari a Milano.

August—Le scritture della ragioneria generale dello Stato: *G. Rossi*. La municipalizzazione del pane. (Cont. e fin): *F. G. Tenerelli*. Partito socialista unico o partiti proletari molteplici?: *E. Rignano*. Riforma delle tariffe telegrafiche: *G. Cavalieri*. Le condizioni del comune di Mantova.

Rivista Italiana di Sociologia. *March—April*, 1905—La ragion d' essere della sociologia: *A. Chiappelli*. Etnologia e Paleontologia: *G. Pinza*. Contributo alla storia della comunione dei beni matrimoniali in Sicilia: *F. Brandileone*. Intorno all' origine dei comuni rurali in Italia: *R. Caggese*. Le condizioni demografiche degli Israeliti in Italia: *P. Mengarini*.

SWITZERLAND—

Journal de Statistique Suisse, 1905—

Band 1, Lief. 2—Die Beschäftigung der schulpflichtigen Kinder in Hausindustrie und andern Erwerbsarten im Kanton Appenzell-a.-Rh.: *Ph. Zinsli*. Mitteilungen über die Preise

SWITZERLAND—*Contd.**Journal de Statistique Suisse*, 1905—*Contd.**Band 1, Lief. 2—Contd.*

der wichtigsten Lebensmittel und anderer Bedarfsartikel im Januar, 1905: *C. Zuppinger*. Mouvement des Sociétés anonymes suisses pendant l'année 1903. Subdivision des cantons et des villes de plus de 10,000 habitants en cercles de recensement, lors du dénombrement du 1^{er} Dec., 1900. Mitteilungen über die Verwendung des zur Bekämpfung des Alkoholismus bestimmten Alkoholzehntels in den Jahren 1889 bis und mit 1903: *Bruno Hildebrand*. Beiträge zur Geschichte des Brauwesens der Schweiz: *Hans Pototzky*.

*Lief. 3—*Krankheitsstatistik der Baugewerbekasse des Bezirkes Zürich vom 1 Januar, 1894, bis 31 Dezember, 1902: *A. Haenisch*. Quelques données statistiques sur les Sociétés suisses de secours aux aliénés: *P.-L. Ladame*. Die gesundheitlichen Erfolge der Ferienkolonien: *A. Kraft*. État des étudiants et auditeurs des universités et académies suisses, semestre d'hiver 1903/1904 et d'été 1904. Sterblichkeit und Invalidität der zürischen Volksschullehrer: *K. Lutz*. Zwölf Jahre einheitlicher Diskontosatz: *Paul Gyger*.

INTERNATIONAL—

Bulletin de l'Institut International de Statistique—

*Tome 14, Livraison 4—*Über die Messung der Fruchtbarkeit und ihr Verhältnis zur Sterblichkeit: *W. Lewis*. Neue Beiträge zur Sexualproportion der Geburten: *J. v. Kőrösy*. Über Arbeitsstatistik: *T. Mataja*. La Méthodologie générale de la Statistique du Travail: *A. Julin*. Die Methoden der amtlichen deutschen Arbeiterstatistik: *T. Leo*. Die Statistik der Aktiengesellschaften: *F. Somary*. Zur Frage der Zollbelastung: *Tr. Geering*. Normalisation des Taux de Mortalité: *G. Sundbörg*.

*Tome 15, Livraison 1—*Statistique de la superficie et de la population des contrées de la Terre. Seconde Partie—3^e et 4^e Sections—Amérique: *E. Lécasseur* and *L. Bodio*. Recensement de la population de la Chine. Formulaire et Instructions: *A. N. Kiær*. Notes sur la législation et la statistique comparées de l'émigration et de l'immigration: *L. Bodio*. Table générale des rapports, communications et mémoires publiés dans les quatorze tomes du Bulletin de l'Institut international de statistique parus depuis sa fondation (1885) jusqu'à la Session de Londres (1905). Vœux émis dans les neuf premières Sessions. *Nécrologies*: Leopold Wilhelmi, Gabriel Tarde, Octave Gréard, Clément Juglar, Arnold Kerdljk.

V.—*Quarterly List of Additions to the Library.*

Additions to the Library during the Quarter ended 15th September, 1905, arranged alphabetically under the following heads:—(a) Foreign Countries; (b) India and Colonial Possessions; (c) United Kingdom and its Divisions; (d) Authors, &c.; (e) Societies, &c. (British); (f) Periodicals, &c. (British).

The Society has received, during the past quarter, the current numbers—either quarterly, monthly, or weekly—of the periodical official publications dealing with the following subjects:—

Consular Reports—From United States and United Kingdom.

Labour Reports, &c.—From Austria-Hungary, Belgium, France, Germany, Italy, United States, New York State, Canada, New Zealand, and United Kingdom.

Trade Returns—From Argentina, Austria-Hungary, Belgium, Bulgaria, China, Denmark, Egypt, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Roumania, Russia, Spain, Sweden, Switzerland, United States, India, Canada, and United Kingdom.

Vital Statistics—From Argentina, Egypt, Germany, Italy, Netherlands, Roumania, Switzerland, United States (Connecticut and Michigan only), Queensland, South Australia, and United Kingdom.

Vital Statistics of following Towns—Buenos Ayres, Buda-Pesth, Brünn, Prague, Brussels, Copenhagen, Berlin, Bucharest, Moscow, Madrid, London, Manchester, Dublin, Edinburgh, and Aberdeen.

The Society has received during the past quarter the current numbers of the following unofficial Periodicals and Publications of Societies, &c., which are arranged under the Countries in which they are issued:—

Denmark—Nationalökonomisk Tidsskrift.

France—Annales des Sciences Politiques. Économiste Français. Journal des Économistes. Monde Économique. Polybiblion, Parties Littéraire et Technique. Réforme Sociale. Le Rentier. Revue d'Économie Politique. Revue de Statistique. Journal de la Société de Statistique de Paris.

Germany—Allgemeines Statistisches Archiv. Archiv für Sozialwissenschaft und Sozialpolitik. Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirtschaft. Jahrbücher für Nationalökonomie und Statistik. Zeitschrift für die gesamte Stantswissenschaft. Zeitschrift für die gesamte Versicherungs-Wissenschaft. Zeitschrift für Sozialwissenschaft. Mittheilungen aus der Handelskammer Frankfurt a. M.

Italy—L'Economista. Giornale degli Economisti. Rivista Italiana di Sociologia. Riforma Sociale. Società Umanitaria, Bollettino mensile.

Sweden—Ekonomisk Tidsskrift.

Switzerland—Journal de Statistique suisse.

United States—American Journal of Sociology. Banker's Magazine. Bradstreet's. Commercial and Financial Chronicle, with supplements. Journal of Political Economy. Political Science Quarterly. Quarterly Journal of Economics. Yale Review. American Academy of Political and Social Science, Annals. American Economic Association, Publications. American Geographical Society, Bulletin. American Statistical Association, Quarterly Publications. American Philosophical Society, Proceedings and Transactions. Columbia University, Studies in History, &c.

India—Indian Engineering. Asiatic Society of Bengal, Journal and Proceedings.

Canada—The Chronicle: Insurance and Finance.

New Zealand—Government Insurance Recorder. Trade Review and Price Current.

United Kingdom—The Accountant. Accountants' Magazine. Athenaeum. Australian Trading World. Bankers' Magazine. Broomhalls' Corn Trade News. Browne's Export List. Colliery Guardian. Commercial World. Economic Journal. Economic Review. Economist. Fireman. Incorporated Accountants' Journal. Insurance Record. Investor's Monthly Manual. Investors' Review. Joint Stock Companies' Journal. Labour Co-partnership. Licensing World. Local Government Journal. Machinery Market. Nature. Navy League. Journal. Policy-Holder. Post Magazine. Produce Markets' Review. Public Health. Publishers' Circular. Sanitary Record. Shipping World. Statist. The Times. Tuberculosis. Anthropological Institute, Journal. Cobden Club, Leaflets. East India Association, Journal. Howard Association, Leaflets, &c. Institute of Actuaries, Journal. Institute of Bankers, Journal. Institution of Civil Engineers, Minutes of Proceedings. Iron and Steel Institute, Journal. Lloyd's Register of British and Foreign Shipping, Statistical Tables. London Chamber of Commerce, Journal. London University Gazette. Manchester Literary and Philosophical Society, Memoirs and Proceedings. Royal Agricultural Society, Journal. Royal Colonial Institute, Proceedings and Journal. Royal Geographical Society, Geographical Journal. Royal Irish Academy, Proceedings and Transactions. Royal Meteorological Society, Meteorological Record and Quarterly Journal. Royal Society, Proceedings. Royal United Service Institution, Journal. Sanitary Institute, Journal. Society of Arts, Journal. Statistical and Social Inquiry Society of Ireland, Journal. Surveyors' Institution, Professional Notes and Transactions. Trade Circulars.

(a) Foreign Countries.

Argentine Republic—

Agricultura. Ministerio de. Boletín mensual de Estadística y Comercio. (Current numbers)	} The Ministry of Agriculture
Buenos Ayres (Province)—	
Dirección General de Estadística. Boletín mensual. (Current numbers)	} The Provincial Statistical Bureau
Demografía, año 1900. 8vo. 1905	
Tucumán. Movimiento de población de la ciudad de Tucumán. (Current numbers.) Cards	} The Municipal Statistical Bureau

Austria-Hungary—

Ackerbau-Ministeriums. Statistisches Jahrbuch für 1903. Heft 2. Lief. 3. La. 8vo. 1905	} The Ministry of Agriculture
Ackerbau-Ministeriums. Statistisches Jahrbuch für 1904. Heft 1. Heft 2. Lief. 1 8vo. 1905	
Arbeitsstatistisches Amt—	} The Austrian Labour Department
Arbeitsvermittlung in Österreich. Ergebnisse der, im Jahre 1904. 8vo. 1905	
Arbeitszeit-Verlängerungen (Überstunden) im Jahre 1904 in fabrikmässigen Betrieben. 8vo. 1905	
Verhältnisse im Schuhmachergewerbe auf Grund der durchgeführten vernehmung von Auskunftspersonen. 8vo. 1905	
Eisenbahnministerium. Bericht über die Ergebnisse der k.k. Staatseisenbahn-Verwaltung für 1904. 4to. 1905	} The Ministry of Railways
Handel. Berichte über die Handelsbewegung, sowie Bewertung der im Jahre 1904 ein-, und ausgeführten Waren des o.-u. Zollgebiets. 8vo. 1905	
	} The Ministry of Commerce

(a) Foreign Countries—Contd.

Austria-Hungary—Contd.

Handel. Statistik des Auswärtigen Handels des Österreichisch-Ungarischen Zollgebiets im Jahre 1904. Band 1, Abteilung 1. Hauptergebnisse-Hafenverkehr. Abteilung 2. Gesamt-Ein- und Aus-fuhr Verkehr mit den einzelnen Staaten und Gebieten. 2 vols., 8vo. 1905	The Ministry of Commerce
Mitteilungen des k.k. Finanz-Ministeriums. Jahrgang 11. Heft. 8vo. 1905	The Ministry of Finance
Österreichisches Wirtschaftspolitisches Archiv (vormals "Austria"). (Current numbers.) 8vo.	The Ministry of Commerce
Gewerblichen Betriebszählung vom 3 Juni, 1902. 1902. Ergebnisse der. Heft 4, Oberösterreich und Salzburg. Fol. 1905	
Statistische Monatschrift. (Current numbers)	
Statistische Nachrichten aus dem Gesamtgebiete der Landwirtschaft. (Current numbers)	The Central Statistical Commission
Österreichische Staatshaushalt in 1901 und 1902. Fol. 1905	
Verkehrs. Statistik des, für 1900 und 1901. Fol. 1905	
Volkszählung 31 Dec., 1900. Ergebnisse der. Heft 2. Fol. 1905	
<i>Hungary.</i> Commerce extérieur des Pays de la Couronne hongroise en 1904. 8vo. 1905	The Central Statistical Bureau
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DECEMBER, 1905.

STATISTICAL SKIMMINGS *from the* INTERNATIONAL CONGRESS.

By SIR. J. ATHELSTANE BAINES, C.S.I.

[Read before the Royal Statistical Society, 14th November, 1905.]

The Right Hon. Lord GEORGE HAMILTON, M.P., G.C.S.I., in the Chair.]

IN the account of the proceedings of the Congress of the International Statistical Institute submitted to the Society in the September *Journal*, the events of that gathering were set forth in chronological sequence with the view, first, of giving a general idea of the size and importance of the meeting, and, also, making known to the Society the various steps taken by those to whom were entrusted the duties of organising the reception and other arrangements, to fulfil, so far as lay in their power, the responsibilities which their colleagues had thought fit to lay upon them. The practical and more interesting side of the Congress, therefore, was left for separate review, and the opportunity has now occurred for laying before my colleagues a brief summary of the subjects brought up for discussion by the representatives of European Statistical Science, and the treatment accorded to each. These subjects were cursorily mentioned in the former paper, from which may have been gathered some notion of the field covered. Speaking generally, the main feature of the Congress, as compared with most of its predecessors, was the relatively small amount of statistical business brought directly before the Congress sitting as a whole. This was in accordance with the decision of the governing Body, that the time of the Congress is more profitably spent in considering the conclusions reached after discussion in Committee than in listening to fresh matter, with regard to which, if action were to be taken, the assistance of the Committee in question would inevitably be found necessary. One result of this course is obviously the exaltation of the

function of the Committees, and the consequent concentration of the interest of the meetings upon their proceedings, and also upon the discussion of their recommendations at the full sittings. Such a distribution of work is undoubtedly in harmony with modern business methods, but there is this difference to be taken into account, that where, as is the case with many of the questions debated before the Congress, opinion enters largely into the decision, dissent by the larger body from the suggestions of the smaller is likely to be far more frequent, and, when expressed, far less invidious than where concrete cases, such as those of administrative detail, are involved. Thus the acceptance, by a Committee, of propositions unimpeachable in the abstract and urged with the whole weight of a few enthusiastic supporters, is often found to be mitigated, or even neutralised, by the caution or wider experience of the Congress as a whole, the latter having to keep itself scrupulously detached from any imputation of administrative interference. Occasionally, however, even the Congress may be thought to have been caught napping by the persuasive and pertinacious ideal-hunter, but usually hard fact has come to the rescue, and the flame has been got under.

In regard to the work done by the Congress, it may be said that, what with the shortness of the papers submitted and their comparatively small number, the output of results was well above the average, whilst as to the quality of the papers contributed, although there was none of marked importance or brilliancy, a high level of business-like investigation and analysis was maintained.

One of the leading features of the work of the Institute, and one which will naturally increase in importance as time goes on, is the continuity of inquiry, with the accompanying accumulation and analysis of material, regarding special subjects. Thus, some of the principal contributions on this, as on other occasions, involved substantially the extension or co-ordination of information brought before the Institute at former meetings, directed mainly, almost, it may be said, invariably, to the elucidation of the statistical errors that may arise from inadequate recognition of the differences between nations in either the basis of the primary record or in the method of classification and treatment. In the original matter presented to the Congress there may be traced throughout the same intention and aim, viz., the establishment of a sound foundation for international comparison. In some cases the author devotes himself exclusively to the analysis and explanation of the facts which are comparable or which, on the other hand, contain elements which vitiate statistical comparison; in others, he himself takes in hand the task of reconciliation, and expounds

the methods by which the adjustment can be effected. In circumstances such as these the ideal plays, no doubt, a prominent and a stimulating part, so that it is not surprising that amongst the opinions formally expressed by the Congress, still more, perhaps, by its Committees, there should be found some few which soar above the sphere of the present, and contemplate an administrative Utopia in which the Governments of our day would find themselves a trifle mediæval in their purview. It does not follow that in this fact there is anything disparaging to those who put forward such aspirations, provided only that they recognise that the road to the promised land has to be solidly constructed stage by stage, and not merely cleared for the occasion, like those prepared to satisfy the Imperial glance of Catherine II on her meteoric raids of inspection to the outposts of her dominions.

A brief reference to the chief contributions placed before the Congress will serve to show to what extent the above general remarks were applicable on this occasion. Under the head of Demography, in spite of several noteworthy examples of good hard work, the proceedings were, on the whole, less important than those in the other Sections. The exhaustive tables of Messrs. Levasseur and Bodio, aided by Signor Grimaldi Casta, give an authoritative statement of the area and population of the countries of America, in continuation of those already published regarding Europe. The countries of the western continent with its adjacent islands are dealt with severally, with a summarised total at the end of the volume. In regard to America, it may be remarked, the compilers had not to deal with historical changes of area or periodical estimates to anything like the same extent as in treating of Europe, so the pamphlet is much shorter. It will be interesting to see what two such experienced investigators make of China in their next volume; still more, what currents will bear them on their flight of conjecture over the greater part of Africa. The papers read (in summary) before the full sitting of the Congress, by Professor Fahlbeck, on the decline and extinction of populations, and by Major Dr. Livi, on the results of anthropometrical inquiry in the Italian Army, could not receive the attention they deserve. The former deals generally with the widely-spread apparent tendency of the birth and marriage-rates to decline amongst the nations of Western civilisation; but the text is not at present available, so no more can be said of it. The anthropometrical data, derived from nearly 300,000 individual measurements, contained in large volumes of elaborate tables, indicated the influence on physical development at different ages and amongst different communities of the transfer from civil to military

conditions of diet and habits. There is a marked distinction between the young men of North Italy, where the standard of life at home is comparatively high, and those of the impoverished South of Italy in this respect, and the reputed earlier maturity of the youth of the warmer climatic zone is proved to be counteracted by the greater room for development left amongst them by the insufficiency of nutriment from which they suffer during the years of adolescence preceding their enlistment. In the case of the students and others of middle and upper classes, where the standard of life is higher, the climatic influence undoubtedly exists, and the development of the southern recruit after enlistment is less than that of his northern comrade. Two subjects, which had been before previous meetings, were left to co-operation with other scientific bodies. The enumeration of population and the record of demographic information in countries where no census has been taken was considered by the last International Geographical Congress, and a committee, collaborating with certain delegates of the Institute, is to investigate the subject. The work of the Institute, in fact, started by M. Kiær in 1899, and continued by me in 1900, was practically concluded by the formulation, at the hands of M. Rubin, of the statistical information it is considered desirable to endeavour to obtain, and the rest can more appropriately be dealt with by the geographical societies, which have a branch devoted to the training of explorers and other travellers. Then, again, the statistical aspect of the question of the extent and treatment of tuberculosis, brought forward by Professor Lexis, and discussed chiefly by the medical members of the Institute, was fitly relegated to experts, acting in collaboration with the International Anti-Tuberculosis Association (which has since met in Paris), in order that statistics relating to the mortality and morbidity of this disease may be examined, and, also, that its treatment in hospitals, sanatoria and dispensaries may be similarly tested. At first glance, this latter point appears hardly within the province of the Institute, but from the proceedings in Paris it seems that statistics of admissions, treatment, and results at the respective classes of establishments have been, to some extent, recorded, and these obviously lend themselves to the sifting processes of impartial experts like Professor Lexis and his colleagues.

The two subjects which received most attention at the sittings of the Demographic Section were the fecundity of marriages and the mortality of large towns, each of which had an afternoon to itself. The former was brought forward by M. Kiær, in the absence of Dr. Körösi, who had been entrusted with a report on the subject by the Committee at its last meeting, and who, as is

well known, has devoted much attention to the question, and has compiled elaborate statistics on it derived from the city of Budapest, wherein he works. The question of further action in the matter will not be decided until the next meeting, when it is hoped that he will be able to resume his share in discussing it. Meanwhile M. Kiær, who, as is probably known to the members of the Society, is interested in this subject, has already published two volumes—one in Norwegian and one in German—of his investigations into the question. On this occasion, using as his text the statistics of Norway, Berlin and New South Wales, amongst others, he showed how essential to the proper elucidation of the fecundity problem are such factors as the age at marriage and at the birth of each child, the duration of the marriage, and the social and economic position of the parents. The diagrams he displayed, based upon tables for the populations above-mentioned, indicated not only the wide field that is already under investigation, but the need for extending it to populations larger and more varied than those he had been able to subject to his examination. Professor Willcox, for example, quoted statistics of comparatively limited scope for the State of Massachusetts, but held out hopes of being able to publish at some future date corresponding information for the whole of the United States, as Mr. Coghlan has done for New South Wales. M. Kiær concluded his paper with a succinct abstract of the heads of information necessary for the investigation, which may stand as the “winning post” of the course of inquiry now being entered. He proposes, for instance, two distinct inquiries, one in connection with a census, the other, in greater detail, over a special and localised field, which may be used as a basis for generalisation, a method of obtaining results of which M. Kiær is, as his colleagues well know, a strenuous advocate. He has not yet, however, converted the Congress to more than a highly reserved agreement with him, under abundant safeguards as to the choice of locality and ample explanations of its character. Apart from that point, there is much reason in what he urges as to the need of a record in cities and rural tracts respectively, showing full details of age of husband and wife at marriage and at the birth of each child, the number of births and the interval between each, the survival of the offspring, and the occupation of the breadwinner. The only points as to which his draft suffered modification at the hands of the Committee were his demands for the classification of the father according to social and financial position; details, he admitted, which are too arbitrary to be included in a statistical catechism.

The other subject, which occupied the attention of this Section for a whole sitting, was the mortality in large cities, bequeathed to

it from the Berlin Congress. Dr. Bleicher, a municipal statistician who has taken up this special point, brought forward his reasons for extending the field of investigation over areas considerably larger than the cities themselves, in order that the death-rates of the surrounding country under different conditions might be compared with the strictly urban rates, and that the whole economic history and position of these larger areas might be brought under review to elucidate the more special feature in question. This proposal was accepted by the Committee, but when placed before the full sitting, a little water, as the Chairman expressed it, was poured into the wine, and it was merely resolved that monographic studies, amongst others, were necessary to establish the conditions of mortality in large cities and rural districts in their reciprocal relations to each other. It would appear, therefore, that instead of diluting the inquiry, the object was to concentrate it, and to continue the practice of specialising investigation into the minute observation of individual aggregates of population. The Institute, it may be observed, has already recorded its opinion that the rate of mortality in large cities should be calculated separately upon the actual population and upon the population adjusted by the exclusion of residents of other places dying in hospitals and prisons, &c., in the town, and the inclusion of residents of the city dying elsewhere, especially with reference to the record of the cause of death. This may be to some extent a counsel of perfection, but the statistical value of the suggestion can be appreciated by any one who has analysed the local returns for London, and noted the influence upon them of large institutions of the above description.

In the Economic Section, M. Neymarck presented a further report upon the subject of Transferable Securities, the international valuation of which has been his special study for many years. In the absence of the new matter he had hoped to present, chiefly expected from the United States, he had compiled an interesting summary of the progress made in the inquiry since 1891, when the importance, from an international point of view, of an evaluation of this species of wealth, was first brought before the Congress at Vienna. The Sub-committee on the subject, constituted four years later, formulated the questions which were afterwards circulated to experts in different countries, the answers to which are being dealt with for the Institute by M. Neymarck himself. He was also able to add a statistical tinge to the International Congress on Personal Property, held in Paris in 1900, and from 1899 downwards he has been able to present at each meeting of the Institute, his estimates for some countries in addition to those already dealt with on

former occasions. In 1902 he gave the total value of transferable securities in Europe as nearly 563 milliards of francs, of which over three-fourths appertained to the three countries, Great Britain, Germany, and France. It is curious to note that, whilst the general average of the values held by natives of the countries issuing them is 61 per cent., this country and Germany retain but 56 per cent., whilst Russia is credited with 71 per cent., and France and Austria with 66. The author contrasts the vast aggregates represented by these figures with the output of gold and silver and the issues of currency in circulation at the time, which he computes at no more than 27 milliards of francs. He dwelt upon the difficulties attending such an inquiry, pointing out that the amount of detail involved necessarily rendered progress very slow, and the Congress, accordingly, formally reiterated its wish that each State should publish officially an annual statement of issues, conversions, &c., of this class of securities. The paper of Sir Alfred Bateman upon Import and Export Statistics, also presented in continuation of former contributions, brought the subject up to date by reciting the changes in methods of classification introduced by the British Government since 1903, by which our system has been brought into harmony with that of most European countries, the grouping in imports and exports being now identical. The United States alone, of all the great commercial countries, now use different groups in the two branches of trade. It is true that the change in question vitiates comparison by groups with the returns of former years, but this comparison can be established by inquirers who pursue the detail of the largest items of trade under each main head. The author also reviewed the changes in the character of the trade of the leading commercial countries during the last fourteen years, more especially in France and the United States. In the former, the proportion to the total of imports of articles of food fell from 33 to 20 per cent., whilst that of the imports of raw materials rose from 53 to 63 per cent. In the United States the proportion of exports of domestic manufactures to the total exports rose from 18 to 29 per cent., and the imports of raw material rose from 23 to 38. The imports of articles of food and of manufactures fell from 32 per cent. to 21, and from 20 to 17 respectively. The varying practice among commercial countries in recording the origin and destination of imports and exports respectively is fully dealt with in one of the appendices, and due prominence is given to the duplicate registration of this information recently introduced into our own customs' statistics. The author again pleaded the cause of declared values against the prevalent Continental and American system of official valuation, and adds to his valuable

series of appendices more information, including the basis of valuation of exports as well as of imports. In Major Craigie's paper on Comparative International Statistics of Agriculture, the tables he presented eight years ago at St. Petersburg are brought up to date, showing in a striking manner the blanks still remaining to be filled up by official data, and also the advantage of distinguishing in the returns the production of the New (agricultural) World from that of the Old, in order to exhibit more clearly the economic facts of the situation as regards the general food supply of civilised countries. The recent drought in Australia, however, together with the general lack of information, deprives the tables of much of their value, especially in the matter of sheep and cattle. So far as the areas in question are concerned, it appears that consecutive figures for wheat can only be got in Russia from 1892, and in Argentina from 1901. The tale of cattle is complete for the whole quarter century in four European countries only, and these do not include either Russia or Germany. There is nothing under this head from Argentina since 1895, yet every railway station in this kingdom appears to testify prominently—albeit not artistically—to the magnitude of the trade with the plains of the southern Republic. It is the same as regards sheep. Argentina can give figures for but two, and Australasia as a whole, for but seven, of the twenty-five years included in the review. It was resolved by the Congress on this paper that it was advisable to get an annual record of the area under each of the principal cereals in every country where it could be compiled, and to ascertain by as frequent enumeration as possible at fixed intervals the number of sheep and cattle. Following Major Craigie, Professor Béla Földes gave a short paper upon the importance of accurate and uniform tables of wheat prices, and the lamentable absence of harmony in the information contained in those tables as now published in the different countries. Having done his best to disentangle the problem, he gave a short table of the average price of wheat at respectively the earliest and the latest decennium of the nineteenth century, for which the data are available in thirteen countries of Europe. He does not allow for any substantial difference in the value of money at the two periods, but the general result shows, he states, the effect of improved means of communication in lowering prices in the importing and raising them in the exporting countries; and, again, in reducing the range of the oscillations. His proposal is that the Institute should devise a form on a scientific basis in which the prices in all countries may be uniformly shown. On this the Congress was good enough to compliment this Society upon the work performed by well-known Fellows in the direction of ascer-

taining and tabulating wheat prices, adding the wish that it should prepare a bibliography of corn prices from the ample resources of its library. This ought not to be a difficult task, though it takes time; but there remains the question of utilising the vast material thus collected in a manner that will be satisfactory from a scientific standpoint, without affording a basis for what Lord Onslow designated as the "entertaining" inferences of active politicians. That question has been already raised of late years in the Congress, in connection with a sub-committee on the effect of customs duties upon sundry factors in the economic life of a country, the members of which, Russian, French, American and Belgian, amongst others, presented a series of papers which, though in many cases fairly orthodox according to the canons of statistics, bore too close a relation to questions of political controversy in the countries concerned to be palatable to the supporters of the fiscal system in force there. The United Kingdom, it should be stated, has not been represented, on paper at all events, in this cockpit. On the present occasion the paper on the subject presented to the Congress was a strong indictment by M. Yves Guyot of the current tariff of his own country, which, however conclusive as to the baleful effects of the local duties he attacked, was not put before the Committee with the view of enlisting their adherence to the condemnation of duties in general which he included in it, and it has since found, I believe, its natural home on the shelves of the Cobden Club. The proposal, therefore, for further inquiry into the reaction of customs duties upon food and articles of primary and secondary manufacture, together with a comparison of the diet of the naval and military population with that of the population in general in different countries, was adopted without reference to the conclusions drawn by any individual author in the papers upon which the discussion had been nominally based. Even this suggestion was not left unopposed by those who considered the inquiry to have an unduly political tendency and likely to end in little beyond the provision of fresh ammunition for political controversy. There is some truth, no doubt, in this contention, but if it were allowed to prevail, the flowing tide of statistical publications would not improbably be checked even beyond the aspirations of Professor Mandello, since the average politician will suck his economic convictions from a return as Jacques sucked melancholy even from an egg.

Dr. Loch's cursory review of the statistics of pauperism in England and Wales during the last fifty years, for instance, though scrupulously impartial and descriptive in character, contained information which at the present moment is of special importance in the political world, and his conclusion that the movement of population

from the rural districts to the towns has enabled the migrants to maintain themselves better, and has led to a marked reduction of official pauperism, is one that will be a surprise, possibly not altogether welcome, to certain groups of would-be legislators. His suggestions for a sound and uniform basis of international comparison of statistics of official relief, by means of a synchronous annual count, supplemented by an age-classification, appear, therefore, remarkably opportune. The different systems under which pauperism is dealt with on the Continent, however, undoubtedly make his proposals difficult to apply in practice, and a valuable exposition of the situation may be expected when the Committee take the question in hand at the next meeting.

The widest subject dealt with by the Economic Section on this occasion was that of the "economic balance of nations," brought forward, in continuation of the discussions at Berlin, by Dr. Ignaz Gruber and M. de Foville. The general subject was dealt with by the former in six pages of a paper which extended to ninety, the remaining eighty-four being devoted to the illustration of the methods suggested by an exhaustive exposition of the statistics bearing on the question in Austria-Hungary. The time at the disposal of the Section did not, as may be supposed, allow of any discussion of details, but it should be mentioned that the paper includes within its scope the reform of the Austrian currency, and nine heads of credits and debits, the balance on which is recorded for the ten years ending with 1901. This shows the amount of work thrown into the subject, which, however, the author admits, circumstances will not allow to be treated exhaustively. All the more credit, therefore, is due to those who go as far as possible in the direction indicated by Soetbeer, when he introduced the term "balance of payments" to denote the resultant of the mutual claims and obligations arising out of the complicated system of international commercial relations; superseding thereby the simple balance of trade, which so often is taken as the touchstone of a nation's economic position. In the paper of Dr. Gruber this balance is only one element in the computation, which combines with it the balance on interest paid and received on State loans; on transactions in transferable securities; on the establishment by foreign capital of industries and businesses conducted within the State (in which traces of the "fiscal" microbe may be found, if diligently sought); on transport by rail or water; on migration to and from the State; and even on the sojourn of foreign travellers on business bent and of visitors to the health resorts which lend such a charm to parts of the dual Monarchy. Wherever the material is not derived directly from its source the author

fully expounds the methods of computation by which he reached the figures given in his general table, and honestly avows the conjectural nature of a good many of them. Nevertheless, the attempt is a noteworthy one, and ought to encourage further efforts in compilation on similar lines. As the author points out, we have many good treatises upon special factors in the economic position of a nation, but attempts to incorporate all these factors into a general total have not yet attained the necessary degree of comprehensiveness or accuracy, and yet the tendency of modern State policy is, in the author's words, "to round off economic communities for economic reasons" and objects." More consideration, therefore, is now due to the circulation of persons, as of merchandise, currency and securities, beyond the limits of the individual State whose position is the subject of investigation. The paper is eminently suggestive, whilst the outlines of the subject, the main landmarks therein, and the difficulties which attend the attempt to reach them, are excellently set forth in the paper of M. de Foville on the Elements of the Economic Balance of Nations, wherein he draws his illustrations from his own country, but without attempting statistical treatment, which he leaves, he says, to his colleague from Vienna. He thus makes room for some of that acute criticism and sprightly admonition which he has led his colleagues to expect from his pen; and the lucky fact that the *sophisme séculaire* of the mercantile system has recently been embraced "with as much confidence as ingenuity" by a prominent French politician, with whose views in general the author does not invariably agree, affords an opportunity for a few quiet *entrechats*, as decorous as those which M. Guyot likes to perform over a French customs report.

I now pass to the third Section, that dealing with the methods and organisation of statistics. Among the papers appertaining to the work of this Committee, though it happened to be presented before the full Congress, was the short review by Professor Mandello of the Future of Statistics, the only contribution on this occasion dealing with the science in general. After noting the recent development in statistical theory at the hands of various well-known exponents, in whose ranks our colleagues Galton, Edgeworth, Bowley and Yule are honourably placed, the author pleaded for an equivalent advance in the direction of a more general understanding on the nature and applicability of the numerous formulæ now in sporadic use among the experts of different nationalities, or, as he expressed it, international agreement as to uniformity of statistical measurements. As to the increased international comparability of statistical data, he rightly attributes a high proportion

of the progress made of late years to the efforts of the Institute, several instances of which he cites from the proceedings of the Congress under review. The shortcomings in this respect, still too apparent, are not curable, he considers, by the mere establishment of an international clearing-house, and herein we shall probably be unanimous in agreeing with him, because the foundation of the differences to which he refers is to be traced to national difference in institutions and circumstances. To whatever extent statistics, as a branch of science, may disregard distinctions of nationality and temperament, it is not to be denied, at least by those conversant with the working of the Institute, that statistics, in their administrative aspect, are not wholly immune from the "wills and passions of "sinful men," and that in the discussion of even statistics, the cosmopolitan child of Mr. Leonard Courtney's dream occasionally shows marked disinclination to place his hand on the den of the national cockatrice. The last reflection made in this paper is that statistical publications are accumulating so fast that they cannot be digested. Endless columns are presented from which few have the time or knowledge to extract the true significance, so people are given to saying that figures lie, when the fact is that liars are taking to figures. Professor Mandello suggests that there need be no diminution in the amount of information collected, co-ordinated and prepared for reference or limited circulation, but that those returns only should be printed which are of admittedly general interest; and that the Central Office, where it exists, should have a Consultation Department, to which recourse may be had when figures are required on a particular subject. The information which ought to be printed for international purposes is a question which the author would refer to a special conference. In regard to the cataract of official publications, Professor Mandello has apparently the sympathy and a little more of a New York newspaper, in which occurred not long ago the following remarks:—

"In its gross output of official statistics, the United States surpasses all "other nations in a degree as marked as that by which its output of cotton, "or corn, or pig iron surpasses the product of other lands. In point of "quality, however, our pre-eminence is not so well established. . . . "It may be well for us to keep our statistical mills in constant operation, but "we should pay more attention to the quality of the grist which they turn out."

There have been of late what the said journalist would call "happenings" in his country which seem to have justified the caution he here expresses. It must be stated, however, that he took the opportunity on the occasion in question to draw a contrast between the statistics he was criticising and those prepared (in Cd.-2337) by our Board of Trade, a compliment which we on

this side of the Atlantic can well appreciate. It was upon this suggestion by the Professor that their supplies of raw material should be curtailed, that the statisticians in Congress assembled proceeded to empty the vials of their wrath. I have not yet had the opportunity of perusing the complete report of what was said, which I failed to hear, being called away early in the discussion, leaving Major Craigie, the temporary Chairman, sitting tight on the safety valve.

Among the papers read before the Committee itself, one of the most noteworthy was a well-edited Note on the census of Industries and of the Unemployed by M. Lucien March. Germany, France and Belgium are the countries from which the greater part of the information was derived. The British view was put forward by Mr. Llewellyn Smith. The whole subject is exceedingly intricate, especially with reference to the record of the unemployed and the distinction between functions which are one time independent, at another subsidiary to a more complex result. It is impossible to attempt, within the scope of this paper, to survey the whole field covered by the memoranda recorded by the numerous experts consulted, and I can only summarise the general proposals submitted to and adopted by the full meeting, representing, it was explained, the minimum which the Committee considered to be necessary for international comparison. These comprised a subsidiary inquiry as to those ordinarily following an occupation but out of work at the time the census was taken, specifying the number of weeks each individual had been unemployed, provided that this did not exceed a year and that the individual was not more than 60 years old. It was also held desirable that for the purpose of obtaining information about want of employment, the ordinary census should be supplemented by more frequent inquiries specially directed to the subject. In regard to the industrial classes generally, the census should include, under the head of each occupation, those ordinarily earning wages at it, whether employed or temporarily out of work, but should not count under it the members of the family engaged in domestic work only. A special heading should be reserved, it was held, for members of the family working at an industry carried on at the home, omitting, for international purposes, the wife of the head of the family and those of his children who were under 15 years old. Then, in the matter of classification, it was decided to recommend the four heads of:—heads of establishments (*chefs*); staff and workmen employed, and the same out of work; and lastly, workers in detached occupations and those only irregularly engaged, according to the nature of the industry. The establishments, again, should be grouped in the tables in specified

classes according to the number of persons employed. As in the case of the international census generally, there is a good deal in this proposition which depends upon the special character of the administration of the country and the objects which the census is intended to fulfil, as, for instance, whether the object is to ascertain the number employed in the industry, or that supported by it. Then, again, the nature and value of the inquiry depend greatly upon whether the return is filled up by the householder or on inquiry by an official enumerator. On the whole, it may be said that such recommendations tend to clear the statistical atmosphere and widen the horizon in view. For the purposes of international comparison, and assuming that the periodical census of the population in general is the source of information, the adoption of a uniform scheme of classification is the first step, without which the general industrial situation remains statistically almost unknown. Within such a scheme of grouping comes the question of the position of the individual and of the establishment, with their mutual relations, all equally in need of agreement as to the basis of their exposition. It was fortunate that the task of presenting the manifold considerations involved in this intricate administrative problem was entrusted to hands as experienced as those of M. March, fresh from dealing with the operations connected with industrial enumeration in his own country. Akin to the question of industry and unemployment is that of the international comparison of wages—to consider which a sub-committee was reconstituted to continue work begun by one appointed several years back. Since then, new departures have been made in various countries with regard to the statistics of labour, but owing to the difference of basis or method, comparison between the results has not been fruitful. In a short paper by Mr. Schloss, some of the drawbacks of this want of uniformity were set forth, and it led to the proposed inquiry. A sub-committee was also approved by the Congress for the purpose of suggesting means of obtaining uniformity in the record of workmen's accidents, of means of insurance and compensation, and of the "co-efficient of risk," viz., the ratio of accidents to numbers open to accident. Sundry propositions embodied in the resolution appointing the sub-committee were also adopted, such as the tabulation by accepted groups of the accidents, the respective gravity of the injuries sustained, the age, sex and civil condition of those afflicted, and the number of persons depending upon their labour. In regard to compensation, however, the sub-committee was instructed to ascertain how far tabulation could be managed in cases where insurance was not compulsory and compensation not brought on to the judicial

statistics of the year. Here, again, as in the case of the census of industry and the record of statistics of marriage, the inquiry has to be somewhat of the "roving commission" order, and its *personnel*, therefore, extends beyond the membership of the Institute, and includes experts recruited from the official staff of different countries interested. A report by General de Wendrich, on the international statistics of transport, mainly by rail, works in to the general scheme of the computation of the "economic balance" of MM. Gruber and de Foville. The author had already contributed details of his scheme with the results of its application to certain branches of traffic, to the Paris Review of Railways and Tramways, and this was supplemented by M. Bernard, statistical officer of the *Nord* system of French railways, who described the use of the "truck-invoice" on those lines. The discussion ended with the recommendation of this document as the best foundation for international statistics of goods traffic, and the inquiry was prolonged in order to get fresh evidence as to how far the practice in different countries can be brought into line for general comparisons. The last subject which came before this Section was the institution of Population Registers, advocated before the Congress ten years ago by M. Nicolai, and now reproduced, fortified by a number of reports received from different States and cities. The general lines of the system may be summarised as the registration of each family and of each domestic occurrence therein, including change of domicile, with an interchange of official notifications of each of the latter between the localities concerned. By these means not merely fluctuations of population between a State and its neighbours are recorded, but the internal fluctuations between its own units. It appears that registration in this sense is compulsory in Belgium, Holland and Italy, whilst it is optional with units of administration in Austria, France, Spain, Germany, Norway and Sweden, where it seems to have been adopted chiefly in large cities, if at all. The case for and against such a measure is argued fully in the paper presented on this occasion by M. Nicolai. Its practicability depends mainly upon the character of the people and, consequently, that of the administration of their conduct and affairs. It entails, of course, a large staff of trained officials distributed over every town and village, and, what is of more importance, the habit of subordination to official regulation. In the end, the Section agreed to the first two of the author's proposed resolutions,

- (1) That States which do not at present make use of population registers should order their adoption, compulsorily by preference;
- (2) That States where such registers are optional should render

them obligatory upon all municipalities and other local units. When, however, these suggestions came before the full Congress, the prominence of the element of compulsion in them proved a bar to their acceptance, and on the motion of M. March, the water—to use the phrase of Professor von Mayr, already quoted—was poured into the wine, reducing the strength of the draught to an academic declaration that the Congress would be glad to see the practice of registration more general. With this brief and characteristically cautious expression may be closed this review of the Tenth Congress. The latter was, as has been shown, satisfactory as regards attendance; it was fortunate in its weather, somewhat barren in extraneous amenities, and, on the whole, faithful to its traditional level in the field of its subjects and in the conclusions at which it arrived.

DISCUSSION *on* SIR J. A. BAINES'S PAPER.

AFTER the preliminary formal business of the meeting, the CHAIRMAN (the Right Hon. Lord George F. Hamilton), in presenting to Mr. R. Henry Rew the Guy Medal in silver for his work in connection with the preparation of the Reports of the Special Committee appointed by the Society to investigate the production and consumption of meat and milk in the United Kingdom, and for his paper entitled “Observations on Production of Meat and Dairy Products,” said that he had great pleasure in doing so, looking to the importance of the work in which Mr. Rew had been engaged, and the excellence of the paper which he had prepared.

Mr. REW said he was much obliged for the kind terms in which his Lordship had spoken, and he thanked the Society for the distinction it had conferred upon him in allowing him to join the goodly fellowship of Guy Medallists.

Sir J. ATHELSTANE BAINES then read his paper.

Mr. CORNELIUS ROZENRAAD said he did not agree with the term used in the paper of “the economic balance of nations,” for it did not represent the exact signification. There were two sorts of balances: on the one hand, the balance of trade, depending on the imports and exports, and, on the other hand, the balance of payments, representing the assets and liabilities of a country; and he took the liberty of suggesting that, instead of calling it “the economic balance of nations,” they should adopt the suggestion of Dr. Soetbeer

and call it the "balance of payments." So far, it had been very easy to give the figures of imports and exports, because they were published by the Boards of Trade of different countries, and one could see at a glance what the commercial balance was if a country had imported or exported more than in former years, &c.; but no one, up to now, had been able to give the balance of payments, for the simple reason that it had been impossible to find out what money had been invested in foreign securities, and the amount of interest thereon. It was further impossible to give accurately the amount of freights between two nations, or to ascertain the profits on the railways that were built. England was the first country to build railways in central South America and other continents, and in that connection this country had made considerable profits; but there were no statistics available about them, and, of course, no contractor would tell his profits. Again, there were the issues made in this country for the account of other nations. They brought commission and interest, and very often a profit on the rate of exchange. None of those items—neither the commissions earned by the banks or the insurance premiums paid to England—could be given accurately. Then again there was the expenditure of foreigners, of which it was impossible to give the exact figures. Numbers of them came here, especially since the *entente cordiale* and the improved railway facilities, and when the Simplon tunnel would be open to the public there would be a still greater development in that direction. It was impossible to tell the amount which those people spent in England. On the other hand, many English went to the South of France, Italy, Spain, Egypt, and other countries, where they spent money. It was therefore absolutely impossible to give the exact balance of payments, and it was useless to recommend such an investigation. There was not a member of that Society, or any other, who could give exact figures. Then again there were numbers of people who went to the Argentine Republic, Brazil, &c., to work, and who remitted a portion of their earnings to their families at home. The amount of such remittances could only be given approximately. But there was one way of dealing with the question: you could always find out on which side the balance lay by the rate of exchange. That was the real barometer of the nations showing the balance of assets and liabilities, provided the rate of discount was the same and there was no difference in the monetary system. It was also only by the rate of exchange that you could see if a nation was over-trading or not. He did not wish to criticise in the slightest degree what had been said, and no doubt it was a question of the highest importance for Great Britain, the banker and carrier of the world, to know exactly the balance of payments by other nations; but he doubted very strongly if ever such a balance could be given.

Mr. A. H. BAILEY said it would be difficult to arrive at exact statistics with regard to the ages at marriage and the fecundity of marriages and the mortality in large towns, but it was very desirable to get information derived from particular societies in which these ages were stated and known. Several years ago he, with a friend,

took out the mortality of the families of the Peerage, having ascertained the accuracy of dates given; and those figures were to be depended upon. In the same way you might get from such sources statistics of marriage, and the fecundity of marriage, and the ages of parents when their children were born, but he did not think you could rely upon them from any general return. He did not think they would ever get a paper filled up giving the ages of all the children, when they were born, and so forth. He had been greatly interested in the paper, but it dealt with such a variety of subjects that he felt it was impossible to criticise it generally.

Mr. W. P. DIGBY wished to ask a question with regard to a collection of internal statistics with respect to manufactures in different countries. Some of the self-governing colonies kept records of the number of hands employed in different factories, the capital value of their plant and buildings, the amount of raw material received during the year, and the value of their out-put, free on rail. The author rather deprecated the introduction of the fiscal microscope, but he thought these international trade statistics might either scotch that microscope or give it greater longevity. When they had this kind of record of the out-put from different factories with regard to specific commodities properly collected under Government auspices, they would no longer have politicians arguing on the fiscal question simply from the point of view of the import and export trade, and ignoring the conditions of the internal production of the articles which formed the subject of their arguments and illustrations.

Mr. J. E. YERBURY asked if the statistics of tuberculosis, after they had been tested by medical experts, were to be treated by that Society in any way? Because it seemed to him that the present time, when there was a national committee sitting on the subject, would be a good and proper one for the Society to take up the matter and deal with those statistics, especially with regard to the treatment of incurables, a subject which ought to be brought prominently under notice at the present time. It was almost impossible to find any treatment at all for incurables.

Major P. G. CRAIGIE said, as one of those who were charged by the Society with the special duty of looking after their foreign guests at the Congress, he should like not only to thank Sir Athelstane Baines for the review he had given them so concisely of the work done, but also to seize the occasion thus presented to assure his colleagues that the communications he had received from members of the Institute who attended in London, proved the general feeling of gratitude for the measure of hospitality which that Society had, in spite of the season when the meeting took place, extended to this gathering. The reports made by many of his foreign colleagues in many different languages bore witness to impressions made by their reception in London, and laid stress on the fruitfulness of the Tenth Session of the International

Statistical Institute. The paper had told them of the great variety of the topics brought forward, and they must have been struck how closely some of the questions bore on problems of social economy and politics interesting to this country at the present time. Physical degeneration or improvement, national advances or decay, the fecundity of marriage, the relative increase of the race in different countries, and the methods of discovering and measuring the growth of wealth and the degrees of national progress were prominent among the matters discussed. All those questions, as well as the inquiry into Poor Law statistics suggested by Dr. Loch, and of which they hoped to hear more in that Society, bore very closely on the issues of the hour. Although Dr. Gruber's paper was long and intricate and in some parts difficult to follow, it was of great importance, and would certainly afford food for reflection hereafter. The most startling of all the suggestions made were, perhaps, those of Professor Mandello. He was not surprised to find the proposals for restricting the output of statistics and for referring to an expert decision what should and what should not be given to the public, met with a good deal of opposition. In this country it was true they had gone rather to the opposite extreme, and had no method at all of controlling and co-ordinating the general output of statistical returns, and we might well reflect on the advantages secured in some countries where central statistical councils were established as part of the machinery of the State. But a large body of opinion still inclined to placing the fullest details in the hands of the public, and leaving them to sift out the wheat from the chaff. He had attended in all the different foreign countries where Congresses had been held, and he thought that Society might congratulate itself both on the number of representatives of so many States here brought together, and on the admirable tone and temper shown in talking over their varying methods and the possibility of developing their science and unifying their practice. For his part, he must say that he had learnt much from meeting with his foreign colleagues, and he was quite sure no one regretted the time or expenditure to which they were put. The Congress having been good enough to leave to him the task of editing the official record of their proceedings, as the temporary substitute of their veteran Secretary-General, Signor Bodio, he would not go now into any further detail, but would only express his thanks to his colleagues of that Society for the support he had received from them in the labours of organisation, which had enabled the Royal Statistical Society, with its Royal Honorary President at their head, to repeat on so satisfactory a scale the welcome which twenty years ago they had extended to the foremost workers in statistical science.

The CHAIRMAN said that, before moving a vote of thanks to Sir J. A. Baines for his paper, he should like to make a remark on the speech of Dr. Rozenraad. He understood the doctor to say that he did not think any conclusions which could be drawn were

worth much as regarded the economic balance between different countries, as there were no reliable data for arriving at such conclusions. But he hoped he did not correctly understand him to say that it was beyond the power of statisticians hereafter to supply some data which would enable one to arrive at something like reliable conclusions. This was one of the most important questions they had to deal with, and he took a great interest in it, because for a great many years he was occupied with the government of India, and they all believed that India had during the last fifteen or twenty years greatly prospered in every way, and that the material condition of the mass of the people had improved under British rule. But when you come to look at the statistics as regarding the economic balance between Great Britain and India you came across a series of facts which were most puzzling. A great portion of the government of India was paid for in this country, although the funds had to be annually transmitted from India. There was not only the interest on loans—a liability which India held in common with other countries—but large payments in connection with pensions and services connected with the administration, which had to be paid here. So that, quite independent of the investment of capital, there was a considerable annual charge on India which she had to transmit from India. Then, the balance of trade was against India, because England exported far more to India than India exported to England. On the other hand, India sent a mass of goods, chiefly raw material, all round the world, and in that process transferred the debt which was due from her to England to other countries, who in some way or other had to pay. Looking at the figures—and he had spent many years over them, so far as trade statistics were concerned—of the exports and imports of countries which had business with Great Britain, it was almost impossible to ascertain how India paid the whole of this annual obligation—whether it was done by securities which came from foreign countries who were indebted to India or in what other form was very doubtful; and it was a question which international statisticians ought to pay attention to. He thought the fault of English statisticians had been that, inasmuch as we had the largest external international trade in the world, we were apt to think that all was well when external trade showed an increase. But that was not necessarily the case in other countries. Therefore he should be glad if there were any person present bold enough to give continuous attention to the question Dr. Rozenraad had raised. He believed that in America, some time ago, the Secretary of the Treasury, Mr. Gage, did propose that there should be an inquiry whether there had been a great increase in the transfer of securities between Great Britain and America. If some inquiry of that kind could be made, he thought a good deal of light would be thrown on one of the most difficult international economic problems, which was becoming more and more difficult; because, in proportion as the transferable securities increased, the more were they transferred, and, as far as he knew, no accurate record was kept of the transfers. He was very glad to hear from Major Craigie that the reception

given to the international delegates was worthy of British hospitality. The author of this paper seemed to think that more people than before who did not speak the truth were now having recourse to statistics. He did not look at it quite in that way. Thirty years ago economic and statistical questions were much more thoroughly gone into than at present. During the last twenty or thirty years emotion and sentiment had rather taken the place of political economy. Sentiment and emotion were admirable motive powers, but they ought always to be harnessed with the facts of statistics in order to show the direction in which we ought to go. His notion of the human race as regards their dealing with statistics was to this effect: he thought there were some who could understand statistics, a second class who could not, and a third class who would not understand them; and the latter were, as a rule, the faddists and idealists. The duty of the statistician was to get hold of the faddist, and to harness him to facts and figures which he could not get away from, and then some practical good might result. His Lordship concluded by moving a hearty vote of thanks to Sir J. A. Baines.

Mr. C. ROZENRAAD said he agreed with what the Chairman had said, that it was possible for a nation to establish the correct balance of trade, because you had the imports and the exports, but he maintained that it was impossible to establish an exact balance of payments. Even if you established it rightly at 12 o'clock, at 12.5 o'clock it would no longer be true, because in the meantime stock would have been transferred from one country to another, travellers would have spent money, and many other things, altering the balance of assets and liabilities of a nation. He suggested that the Society might offer a prize for an essay which would establish an approximate balance of payments, and if ever anyone could establish a correct balance, such a man deserved a statue.

Mr. JESSE ARGYLE, referring to the proposed industrial census described at p. 685 of the paper, asked whether that meant that there was to be a classification according to the numbers actually earning their living in any scheduled occupation? If so, it would be a very desirable thing to have. It always struck him as a weak point about the ordinary census of occupations that although it gave the numbers actually employed in a particular trade, it did not give it in a way by which you could ascertain the numbers getting their living by any industry, manufacturing or otherwise, because the whole of the commercial and clerical staff were omitted, being lumped together under one heading. Every factory included as part of its staff not only those directly engaged in manufacture itself, but also a number of clerks, travellers, carmen, and others, who as much got their living out of that particular industry as did the mechanics or labourers. There were two subjects on which information was needed as to each important branch of industry. First, the numbers actually obtaining a livelihood by the occupation, and secondly, the total population supported by it (*i.e.*, including wives, children, servants, &c.).

Mr. F. PLATT-HIGGINS, M.P., asked if any discussion took place at the Congress with regard to a quinquennial census.

Sir J. A. BAINES, in acknowledging the vote of thanks, said that as his paper was merely descriptive of the views put forward by others, he was not, strictly speaking, entitled to argue on the merits of those views. Still, relying upon his knowledge of the works in question, he would do his best to dispose of most of the points that had been mentioned. First, then, in regard to a quinquennial census, he could state that, though the question had not been raised on the present occasion, the practice of France and Germany was undoubtedly favoured by most of the members of census departments abroad. In reference to the paper by Dr. Gruber, he had expected that both the subject and the method would be much criticised, and he regretted that the account he had given of it did not do justice to the scope and wealth of detail of the original. He thought that the term "economic balance" was fairly equivalent to that of the "balance of payments," as what was sought was to ascertain the difference between assets and liabilities, not merely commercial, but generally those of an economic character. The course of exchange was, as Mr. Rozenraad had said, a most significant feature in the situation, and was stated by Dr. Gruber in two long tables appended to the paper. Place had also to be given by him to the estimated profits on local undertakings reaped by residents of other States. The scheme included also the results of the labours of Messrs. Neymarck and de Wendrich, illustrating how the Institute could be used in co-ordinating the work of one member with that of another and independent inquirer. As to the statistics of tuberculosis, he was sure the Society would welcome a paper from an authority like Dr. Newsholme, for example, who was on the sub-committee of investigation, but the statistics were hardly safe in the hands of other than experts, except so far as the sifting process falls within the province of general statistical method. In respect to what had been said about the "fiscal microbe," personally he was not indisposed to see it statistically treated, but his experience showed that when outside opinion was strongly divided on a subject of this sort, even statisticians, though they might agree upon the selection of the material used, would be certain to differ as to the conclusions they draw from it. Mr. Bailey suggested, he thought, that statistics regarding fecundity could not be safely taken from registration or census, but should, like mortality rates, be collected by special means, and deduced after expert investigation. In the case of births and marriages, he thought that such an expedient was not within reach, though it could be obtained, as in New South Wales, by registration. He admitted, however, that what was easy in a new country would be very difficult in one where registration was firmly established upon a less extended basis, and where any extension of official inquisitiveness would certainly be resented. Mr. Argyle had asked two very important questions regarding the census of industries. No doubt, if possible, the enumeration

should include both the active and the nutritive side of each main occupation. In this country only those actually or habitually working are included. In India, in the census of 1891, both workers and dependents were combined, in order to show the supporting power of each occupation. In France, and in India in 1901, the two classes were shown separately; and this is the best plan, provided the data can be assumed to be accurate in detail. Then, again, the supporting power of an industry ought, no doubt, to include those living by it, though not working mechanically at it; as, for instance, clerks, superintendents, typewriters, watchmen, and the like. This means the distribution of the overgrown headings in the British tabulation under the separate industries, as suggested in M. March's draft. Some would go further in this direction, and would group domestic servants under the professions of their employers. Logically this follows upon the preceding suggestion, but he thought that the refinement was too pronounced, as the relation of the clerk or mechanic to his occupation was far closer than that of the cook or housemaid to the work of her employer. Reverting for a moment to Mr. Rozenraad's observation as to the incessant fluctuation of the balance of payments, he would point out that the same factor occurs in the census of a population, where, as in India, the 300 millions are increasing by thousands every minute. All that is aimed at in the census is a photograph at a given moment, and the same view might be taken of the economic position of a country, or else the computer might adopt the mean figure of the year; it mattered not, so long as the annual intervals were equal in the case of a single country, or more or less synchronous when several countries are compared together.

He thanked the meeting for the kind reception they had given to what was avowedly but a makeshift paper, and he hoped he had been able to show that the Congress had produced a fair amount of work, valuable, not only on its own merit, but as a stimulus, as in the case of Dr. Gruber's paper, to further investigation.

The following were elected Fellows of the Society:—

Beaven, Edwin Sloper.

Bonn, Max J.

Brothers, Orlando Frank.

Campbell, Richardson.

Coles, Richard John, F.C.I.S.

Frings, Francis A.

Gubbay, M. M. Simeon.

Leake, Percy Dewe.

Loyd, Archie Kirkman, K.C., M.P.

MacGregor, D. H., M.A.

Olivier, P. M.

Sellar, Alexander Smith, M.A.

Silva, N. P. Da Motta E.

Steiner, Dr. Maximilien.

Thomas, Percy Scofield.

On the CORRELATION of SUCCESSIVE OBSERVATIONS;

ILLUSTRATED *by* CORN PRICES. *By* R. H. HOOKER.

WHEN it is desired to ascertain whether two particular phenomena, for both of which a series of observations is available, are interdependent, it is usual to adopt the method of correlation. The formula almost invariably utilised for this purpose is $r = \frac{\sum x x'}{n \sigma \sigma'}$, where x and x' are the deviations of any two corresponding observations from the arithmetic means, and σ , σ' are the standard deviations, of the two series.

Such a comparison affords a test of similarity of the two phenomena as influenced by the totality of the causes affecting each of them. When, however, the observations extend over a considerable period of time, certain difficulties arise in discussing the relations between the two variables. These difficulties, which find no precise parallel in the case where the whole of the observations refer to the same moment of time, are due to the fact that outside conditions—*i.e.*, those affecting the variables unequally—may be very different after a certain period, so that the values of the two variables may have been considerably and unequally modified by them. If a diagram be drawn, illustrating by “curves” the changes of the two variables during the period under investigation, some relation will often be apparent (or suggested) between the usually smaller and more rapid alterations between successive observations, while the slower “secular” changes may or may not exhibit any similarity. If, then, the correlation coefficient be formed in the ordinary way, we shall obtain (*a*) a value that is very high if the “secular” changes are similar (the value being almost entirely independent of the similarity or otherwise of the more rapid changes), (*b*) a value approximating to 0 if the “secular” changes are of quite dissimilar character, even although the similarity of the smaller rapid changes may be extremely marked. The “secular,” in fact, may entirely mask the other changes, and deductions drawn from the ordinary correlation coefficient as to the interdependence of the two phenomena may in such cases be erroneous. What is required is to eliminate in some way the changing influences which affect the two variables unequally.

In a paper published in this *Journal* in 1901,¹ I have suggested a method which is often useful in the particular case of two variables subject to oscillations of a more or less periodic character, viz., by the use of an "instantaneous average" (or *trend* of the curve, as I there called it), instead of the arithmetic mean in the above formula. I now desire to direct attention to a method of a very simple character, applicable whether the smaller rapid changes under investigation are of a quasi-periodic character or not. The method will probably be found most serviceable in economic inquiries, as in the illustrations that follow; but it appears to be equally applicable in other branches of science where time is involved. It consists simply in calculating the correlation coefficients of the differences between successive values of the two variables, instead of the differences from the arithmetic means.

Consider two series of observations, $x_0, x_1, x_2 \dots x_n$, and $x'_0, x'_1, x'_2 \dots x'_n$, and let d, d' represent the differences between any two consecutive observations in the first and second series respectively. Also let \bar{d}, \bar{d}' be the mean differences between successive observations in each series; i.e., let

$$\bar{d} = \frac{\sum d}{n} = \frac{x_0 - x_n}{n}, \quad \bar{d}' = \frac{x'_0 - x'_n}{n}.$$

The standard deviations (δ, δ') are calculated in the ordinary way, viz., $\delta = \sqrt{\frac{\sum (d - \bar{d})^2}{n}}$, $\delta' = \sqrt{\frac{\sum (d' - \bar{d}')^2}{n}}$.

The correlation coefficient which I suggest as frequently useful is $\rho = \frac{\sum (d - \bar{d})(d' - \bar{d}')}{n\delta\delta'}$.

This may also be written $\rho = \frac{\sum dd' - n\bar{d}\bar{d}'}{\sqrt{(\sum d^2 - n\bar{d}^2)(\sum d'^2 - n\bar{d}'^2)}}$, a form which is easier to use in actual calculation.

The particular problem which led me to consider the desirability of using, in certain cases, a formula correlating the differences between successive observations, was in connection with corn prices. Certain restrictions had been placed by the German Government upon the corn market at Berlin, resulting in the suspension of the Produce Exchange at that city, and it was alleged that while the restrictions were in force the price of corn at Berlin was much steadier. The problem to be investigated was therefore: Was the Berlin market rendered more stable by these restrictions, or, in other words, were prices at Berlin more or less independent of those at other markets during 1897-99 than previously? From a calculation of the mean daily movement of

¹ Vol. lxiv, 1901, p. 485.

the price of wheat in each of the years 1892-99 at Berlin, Chicago and Liverpool,² I arrived at the conclusion that Berlin responded to the influences of other markets to an extent that was not less in 1897-99 than in 1892-96; *i.e.*, that the restrictions had not induced any greater stability of price. I then worked out the correlation coefficients of these prices in the ordinary way. The results of this calculation were unsatisfactory, because the "secular" changes due to "world influences" in certain years were so great as to completely mask the small daily changes. Normally, the prices at all markets would be above the mean for one continuous portion of the year, and below it for the remainder; hence the coefficient of correlation was necessarily high, except in certain years, such as 1899, of abnormal stability. The coefficients obtained thus did not admit of deductions being drawn as to the relative stability during different years; and I accordingly endeavoured to find a better measure of their interdependence by working out the correlation coefficients of the changes recorded in the prices from day to day.

Before quoting the figures obtained, attention may perhaps be drawn to two practical advantages offered by this method of correlation. The first is rather special to the actual case under investigation. By calculating ρ a sufficiently trustworthy coefficient between Liverpool and the other markets can be obtained for 1896, whereas the ordinary correlation coefficient cannot be ascertained for that year with any degree of accuracy. The reason for this is that I could not find any one grade of wheat (of the quality desired) quoted throughout 1896 at Liverpool; but I had continuous records of one grade available for several months, and of another grade, not very different, for the remaining months of the year, the two sets of prices overlapping for a short period. During this short period there was a difference of 2*d.* per cental between the two grades; this can be allowed for, and the change made from one grade to another without danger of error in the proposed coefficient. For, if the prices of the two grades of wheat (supposing both to be existent for the remainder of the year) did not run parallel, but diverged from each other by a very few pence (it could not be more), this would cause no appreciable difference in the mean daily change, being only those few pence divided among one or two hundred days; but it would very seriously affect the average price, standard deviation, and consequently the ordinary correlation coefficient.

² *Journal*, vol. lxiv, 1901, pp. 574 *et seq.* To this paper I must refer for full explanations as to the prices selected, their reliability, comparability, &c., as also for the reasons which led me to adopt the mean daily movement

$\frac{\Sigma(x_m \sim x_{m-1})}{n}$, rather than the standard deviation, as a measure of stability.

A further useful feature of this method of correlation is that it enables us to allow for, and ascertain,³ the average lag of one phenomenon behind another. In the present instance, business hours at Chicago are only commencing when the business day is closing in Europe; hence, if Berlin is affected by the changes on any particular day at Chicago, it will be by those of the preceding day. Correlating the deviations from the arithmetic mean of the year would, it is hardly necessary to point out, give a coefficient practically identical, whether we correlate with the same or previous day's quotation. I have therefore also calculated ρ by correlating the changes at one market with the preceding day's change at the other; also with the average of the preceding and same day's changes at the other, and with the average of the preceding day and two days before at the other. It may be noticed that, were we dealing with phenomena that are, or may be conceived as, continuous (such as trade and the marriage-rate), the average of the same and the previous day's observations might justifiably be regarded as the observation of twelve hours previously. In the present case, inasmuch as the observations occur only at specific periods, and no market is held during the interval, such an interpretation can hardly be maintained.

The results of the calculations are shown in Table I.

Assuming that the higher value of ρ gives the truer indication of the connection between the two markets, it will be seen that, as expected, Berlin shows a greater degree of correlation with the previous day's Chicago quotation, except in the single year 1896. On the other hand, in three out of four years for which the figures are available, a higher coefficient is obtained by correlating the Liverpool change in price with the change on the same day at Chicago. This is rather unexpected: but it does not necessarily imply that Chicago is more dependent upon Liverpool than is Liverpool on Chicago. It will be observed that the exception is the year of the Leiter corner, when the influence of Chicago was notoriously exceptionally great. The highest coefficients of all are those between Berlin and Liverpool (on the same day); this may be interpreted as meaning that Berlin pays more attention to what is going on at Liverpool than to what took place on the previous day at Chicago; a conclusion that does not seem at variance with *a priori* considerations. Moreover, it will be noticed that the correlation of the European with the American markets is greater if we take the average of the American change on the same and preceding days: the tendency therefore appears to be for Europe to follow the

³ Cf. also *Journal*, vol. lxiv, 1901, p. 487.

TABLE I.—Correlation Coefficients of Daily Change in Price.* (All Positive.)

Year.	Berlin and Chicago.				Berlin and Liverpool.				Liverpool and Chicago.			
	$\rho_{t(c-1)}$	$\rho_{t(c-1\frac{1}{2})}$	$\rho_{t(c-\frac{1}{2})}$	ρ_{td}	$\rho_{t(t-1)}$	$\rho_{t(t-1\frac{1}{2})}$	$\rho_{t(t-\frac{1}{2})}$	$\rho_{t(c-1)}$	$\rho_{t(c-1\frac{1}{2})}$	$\rho_{t(c-\frac{1}{2})}$		
1892.....	0.301	0.266	0.343	—	—	—	—	—	—	—		
'93.....	0.246	0.228	0.284	—	—	—	—	—	—	—		
'94.....	0.190	0.130	0.214	—	—	—	—	—	—	—		
'95.....	0.304	0.315	0.412	—	—	—	—	—	—	—		
'96.....	0.254	0.345	0.432	0.126	0.422	0.171	0.370	0.324	0.345	0.278	0.481	
'97.....	0.357	0.308	0.462	0.194	0.482	0.142	0.412	0.319	0.376	0.318	0.483	
'98.....	0.337	0.308	0.389	0.132	0.582	0.075	0.462	0.429	0.254	0.347	0.412	
'99.....	0.254	0.191	0.275	0.070	0.184	0.041	0.184	0.191	0.221	0.161	0.303	

* I have adopted the following notation, corresponding, as nearly as may be, with the notation adopted for the correlation of oscillations in my earlier paper (vol. Ixiv, p. 488) :— ρ_{tc} indicates the correlation coefficient between Berlin and Chicago. When the change in price at one market is correlated with that of the preceding day at another, this is indicated by writing -1 after the initial of the latter town. When the correlation is with the average of the same and preceding day, the 1 is replaced by $\frac{1}{2}$, and the average of the two preceding days is denoted by $1\frac{1}{2}$, $e.g.$, $\rho_{t(c-1)}$ indicates the correlation coefficient between the change of price at Liverpool and the average change of the two preceding days at Chicago.

trend of the American markets rather than every individual movement.

In the following table I have placed side by side the ordinary correlation coefficients, as obtained in the paper already referred to,⁴ and the coefficients obtained by correlating the successive changes in price at Berlin and Liverpool with the preceding day's Chicago change, and at Berlin with the same day's Liverpool change:—

TABLE II.—*Ordinary Correlation Coefficients (r), and Coefficients obtained by Correlating Daily Changes (ρ). (All Positive.)*

Year.	r_{bc} .	r_{bl} .	r_{lc} .	$\rho_{b(c-1)}$.	ρ_{bl} .	$\rho_{l(c-1)}$.
1892....	0.966	—	—	0.301	—	—
'93...	0.287	—	—	0.246	—	—
'94....	0.836	—	—	0.190	—	—
'95...	0.775	—	—	0.304	—	—
'96....	0.865	—	—	0.254	0.422	0.324
'97....	0.929	0.929	0.958	0.357	0.482	0.319
'98...	0.903	0.909	0.953	0.337	0.582	0.429
'99....	0.430	0.397	0.634	0.254	0.184	0.191

It will be seen that ρ is throughout less than r . This may, I think, be taken as an indication that the influences of local conditions at one market upon another are less than the whole of the influences affecting both markets.

Although correlation of the daily changes yields coefficients lower than those obtained in the ordinary way, they are more consistent. While the ordinary coefficients between Berlin and Chicago range from + 0.287 to + 0.966 in the nine years under review, ρ varies only between + 0.190 and 0.357; and the coefficients are certainly as high during the three years 1897-99, as during 1892-96. So that, judged by this test also, Berlin prices were not less dependent upon the quotations at other markets while its Produce Exchange was suspended than previously.

Before leaving the subject of corn prices at different markets, it may be desirable to give the standard deviations of the daily changes in prices at the different centres. For reasons quoted in my earlier paper dealing with the Berlin market, I considered the "mean daily movement" to be a better guide of individual stability than the ordinary standard deviation. In most statistical calculations, however, the standard deviation, $\sigma = \sqrt{\frac{\sum(r - \bar{x})^2}{n}}$, is usually regarded as a better measure of variability than the mean

⁴ *Loc. cit.*, p. 604.

variation, $\frac{\Sigma(x \sim \bar{x})}{n}$; and for similar theoretical reasons, in the present case, the standard deviation of the daily movements is probably preferable to the mean daily movement as an indication of the variability of each individual market. I have therefore calculated them, and in the following table compared them with the mean daily movements given in vol. lxiv, p. 600. They may also be compared with the ordinary standard deviations quoted on the same page.

TABLE III.—*Standard Deviations of the Daily Movements, and Mean Daily Movements, of the Price of Wheat at Berlin, Liverpool, and Chicago. (Pence per Cental.)*

Year.	Standard Deviation of Daily Movement.			Mean Daily Movement.		
	Berlin.	Liverpool.	Chicago.	Berlin.	Liverpool.	Chicago.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
1892 ...	$\frac{3}{4}$	—	$\frac{5}{8}$	$\frac{1}{2}$	—	$\frac{1}{2}$
'93 ..	$\frac{3}{8}$	—	$\frac{5}{4}$	$\frac{1}{8}$	—	$\frac{5}{8}$
'94 ...	$\frac{1}{2}$	—	$\frac{5}{8}$	$\frac{1}{4}$	—	$\frac{1}{2}$
'95 ...	$\frac{1}{2}$	—	$\frac{3}{4}$	$\frac{1}{4}$	—	$\frac{5}{8}$
'96 ...	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{5}{8}$
'97 ...	$\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$
'98	1	$1\frac{5}{8}$	3	$\frac{5}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$
'99 ..	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{2}$

These figures indicate that the daily changes were, on the whole, more violent at Berlin, as at Liverpool and Chicago, during 1897-99, than during 1892-96. Of course the greater instability of 1898 at Berlin is due to the Leiter corner; but there is no evidence to show that the German legislation rendered the market steadier, and the comparison of the correlation coefficients has indicated that Berlin was not less closely connected with other markets than previously.

Reverting now to the practical use of ρ , it may perhaps be considered that the example given is not very conclusive as to its value; and it therefore appears desirable to give a further very simple but striking illustration of its ability to afford more definite evidence of the interdependence of two series of observations than r in certain cases. For this purpose I may refer to the diagram on p. 652 of vol. lxiii, exhibiting the farm price of maize in Iowa and the total production of maize in the

United States.⁵ Although the production has, on the whole, rapidly increased since 1870, the price has fluctuated about an average that has remained practically stationary; nevertheless, it is obvious from inspection of the figures that they are intimately connected, and that, speaking generally, when production increases in any given year the price falls.⁶ Correlating in the ordinary way the deviations from the arithmetic mean we obtain a coefficient of -0.28 only, with a probable error of 0.14 , figures suggestive of very little connection between price and production. [As time goes on, unless there be a radical change in the conditions of maize cultivation, this coefficient must approximate to 0.] Correlating the successive changes from year to year, we obtain the very high coefficient of -0.84 , indicating that the amount of maize produced in the United States is much the most important factor in the price paid in Iowa.

In conclusion, it hardly seems possible to lay down definite rules as to the particular values most desirable to use in forming the correlation coefficient in any particular inquiry. Perhaps it may be suggested that, speaking generally, in examining the relationship between two series of observations extending over a considerable period of time, correlation of absolute values (deviations from the arithmetic mean) is the most suitable test of "secular" interdependence, and may also be the best guide when the observations tend to deviate from an average that may be regarded as constant. Correlation of the deviations from an instantaneous average (or *trend*) may be adopted to test the similarity of more or less marked periodic influences. Correlation of the difference between successive values will probably prove most useful in cases where the similarity of the shorter rapid changes (with no apparent periodicity) are the subject of investigation, or where the normal level of one or both series of observations does not remain constant. It may even, in certain cases, be desirable to combine the two methods, and to correlate the deviations from the mean in the one series with the successive changes of the other.

⁵ In calculating the coefficients which follow, the corresponding data for later years (1900-04) have been included. The figures are taken from the "Year-Book of the United States Department of Agriculture."

⁶ The true relation is probably with supply rather than production, *i.e.*, the stocks left over from a year of abundance are not negligible.

MISCELLANEA.

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- I.—*The Statistics of Wages in the United Kingdom during the Last Hundred Years. (Part XIII.) Engineering and Shipbuilding. D. Dockyards and Railway Centres. With Errata and Addenda to Part X. By A. L. BOWLEY, M.A., and GEORGE H. WOOD.*

Wages in H.M. Dockyard.

THE only important series of wages of men employed in H.M. Dockyard is that which may be compiled from the annual Naval Estimates. There are isolated statements of the rates at which various classes of men are employed, but the system of advance by increments, which prevails throughout the service, makes it doubtful if at any time these statements are representative of the wages of the majority of workers of the classes mentioned. For this reason, therefore, it has been thought unnecessary to print them. They are to be found in L. Levi, *Wages and Earnings*, 1867; the Labour Commission, *Final Report*, Part II, and in three papers dealing specifically with wages of workmen in naval establishments, C-7135 of 1893, 386 of 1893, and 250 of 1896. The first of these contains some information of a more valuable character, as it shows the number of men employed at various rates. This information has been summarised in the following table:—

TABLE 1.—*Home Dockyards. Daily Wages in 1893.*

Totals in Occupation.	Numbers Rated at															
	2s. 9d. to 2s. 11d.	3s. to 3s. 2d.	3s. 3d. to 3s. 5d.	3s. 6d. to 3s. 8d.	3s. 9d. to 3s. 11d.	4s. to 4s. 2d.	4s. 3d. to 4s. 5d.	4s. 6d. to 4s. 8d.	4s. 9d. to 4s. 11d.	5s. to 5s. 2d.	5s. 3d. to 5s. 5d.	5s. 6d. to 5s. 8d.	5s. 9d. to 5s. 11d.	6s. to 6s. 2d.	6s. 3d. to 6s. 5d.	6s. 6d. to 6s. 8d.
Selected Occupations.																
Establishment and Hired—																
Totals—																
Establishment Hired																
Together																

Note.—Included in the totals, but not in the detailed list, are blockmakers (30), bricklayers and masons (15), caulkers (155), engine keepers (8), hosemakers (5), locksmiths (6), messengers (44), painters and glaziers (14), riggers, ropemakers, and sailmakers (426), sawyers (88), and one or machine-man, and wheelwrights (16).

In addition to the 16,578 men included in the above table, there are 537 paid at special rates as to which no information is given; also 163 spinners, 924 boys, and 1,163 other persons, yard craftsmen, in the Store Department or others included in the total from which the table is compiled (Cd-7135).

TABLE 2.—*Home Dockyards. Numbers Employed and Total Wages, 1850—1904.*

Year.	Number on Establishment.	Special Hired Men.	Other Hired Men.	Steam Factory.	Establishment and Special Hired Men. Average Wages.	Steam Factory. Average Wages.	Total.		Average Wage.	Index Number.
							Em- ployed. Number.	Wages.		
					£	£		£000's	£	
1850-51 ...	9,621	420	—	1,155	53·2	51·8	11,196	594·0	53·1	89
'51-52 ...	9,537	330	—	1,064	52·9	55·5	10,931	582·4	53·3	89
'52-53 ...	9,442	269	—	1,046	53·3	73·2	10,751	593·6	55·2	92
'53-54 ...	9,442	314	—	1,200	53·3	62·5	10,956	595·2	54·3	90
'54-55 ...	9,621	314	—	1,290	54·0	65·8	11,225	621·0	55·3	92
'55-56 ...	10,850	489	—	2,079	54·1	62·5	13,418	744·0	55·4	92
'56-57 ...	10,850	489	—	2,510	54·1	66·7	13,849	782·0	56·5	94
'57-58 ...	10,850	626	—	2,382	55·6	58·8	13,858	777·8	56·1	94
'58-59 ...	12,190	412	—	2,361	58·5	59·3	14,963	877·8	58·7	98
'59-60 ...	10,850	412	6,621	2,440	60·4	51·4	13,702	820·1	59·9*	100
							20,323	1273·9	62·7†	100
'60-61 ...	10,850	324	4,815	2,440	59·0	59·4	18,429	1162·5	63·1	101
'61-62 ...	10,850	482	1,147	2,440	60·0	59·4	14,919	875·7	58·7	94
'62-63 ...	10,800	452	1,859	2,440	57·0	59·4	15,551	866·8	55·7	89
'63-64 ...	10,716	419	1,946	2,471	57·2	59·8	15,552	865·1	55·6	89
'64-65 ...	10,268	444	5,678	2,894	57·5	59·2	19,284	1112·3	57·7	92
'65-66 ...	9,611	282	4,960	2,894	61·0	59·2	17,747	1026·4	57·8	92
'66-67 ...	9,407	242	5,156	3,146	61·6	62·3	17,951	1034·3	57·6	94
'67-68 ...	9,389	—	5,797	3,135	63·9	62·4	18,321	1064·7	58·1	93
'68-69 ...	9,174	—	3,325	2,773	64·4	61·3	15,272	904·2	59·2	94
'69-70 ...	8,680	—	3,156	2,249	64·0	63·3	14,085	829·6	58·8	94
		Hired Artisans and Labourers, including Steam Factory.	Other Hands, mainly Rope-makers.	Establishment.	Hired Artificers and other Labourers and hands, mainly Ropemakers					
1870-71 ...	6,905	4,118	253	64·8	45·3 53 weeks	11,276	645·7	56·2‡	90	
'71-72 ...	6,448	6,078	324	64·5	48·3	12,850	724·8	56·4	90	
'72-73 ...	6,410	6,054	294	65·4	49·5	12,758	733·8	57·5	92	
'73-74 ...	6,080	7,027	273	76·5	53·4	13,480	860·6	63·8	102	
'74-75 ...	6,080	7,823	397	76·7	54·6	14,300	915·7	64·0	102	
'75-76 ...	6,080	9,505	415	78·4	58·5	16,000	1047·2	65·5	104	
'76-77 ...	6,080	9,605	424	77·0	56·8	16,109	1037·9	64·4	103	
'77-78 ...	7,080	8,621	409	77·8	54·4	16,110	1041·7	64·7	103	
'78-79 ...	7,080	8,644	387	78·0	54·2	16,111	1041·8	64·7	104	
'79-80 ...	7,080	8,658	313	77·8	54·9	16,051	1042·4	64·9	104	
'80-81 ...	6,870	8,751	231	76·6	55·2	15,672	1014·0	64·7	103	
'81-82 ...	6,869	9,096	—	78·6	57·8	15,965	1065·6	66·7	106	
'82-83 ...	6,858	9,990	—	77·2	58·0	16,848	1109·0	65·8	105	
'83-84 ...	6,843	11,350	—	77·2	59·4	18,223	1203·9	66·1	105	
'84-85 ...	6,807	11,634	—	77·2	59·5	18,441	1217·9	66·0	105	
'85-86 ...	6,582	11,707	—	75·7	63·8	18,289	1245·2	68·1	109	
'86-87 ...	6,577	12,865	—	75·8	61·8	19,442	1293·9	66·6	106	
'87-88 ...	6,579	12,525	—	77·2	61·7	19,104	1281·1	67·1	107	
'88-89 ...	6,000	12,047	—	78·0	61·6	18,047	1210·2	67·1	107	
'89-90 ...	5,600	12,590	—	78·0	61·6	18,190	1212·6	66·7	107	
'90-91 ...	5,360	13,711	—	77·8	62·3	19,071	1271·0	66·6	107	
'91-92 ...	5,733	13,337	—	81·3	65·6	19,070	1341·1	70·3	112	
'92-93 ...	5,907	14,206	—	84·1	66·4	20,113	1439·9	71·6	114	
'93-94 ...	5,902	13,355	—	84·0	65·1	19,257	1365·0	70·9	113	
'94-95 ...	5,907	12,838	—	84·6	65·3	18,745	1337·8	71·4	114	
'95-96 ...	5,929	13,134	—	84·7	65·4	19,063	1360·6	71·4	114	
'96-97 ...	5,942	17,107	—	84·3	67·0	23,049	1647·0	71·4	114	
'97-98 ...	5,942	15,505	—	84·0	66·6	21,447	1531·2	71·4	114	
'98-99 ...	5,941	17,569	—	86·1	68·0	23,510	1707·9	72·6	115	
'99-1900 ...	5,935	20,107	—	84·1	67·7	26,042	1861·3	71·5	114	
1900-01 ...	5,976	20,279	—	83·4	69·0	26,255	1896·5	72·2	115	
'01-02 ...	6,016	22,199	—	83·9	69·6	28,215	2049·5	72·6	115	
'02-03 ...	6,036	22,172	—	85·0	66·5	28,238	1987·4	70·4	112	
'03-04 ...	—	—	—	—	—	—	—	—	—	

* Excluding other hired men.

† Including other hired men.

‡ 53 weeks, average reduced by $\frac{1}{3}$.

The principal information from the Annual Estimates is contained in Table 2, which shows the number employed and the total wages estimated to be paid, and in Table 3, which shows the number employed in the various classes of occupations. It is doubtful how far the average wages stated in Table 2 are comparable year by year, as 53 weeks' wages are paid in some years, and allowance is made for this in one case only. The average is also much affected by changes in the relative numbers of the various classes employed, and especially by changes in the relative numbers of established and hired men in each year.

TABLE 3.—*Numbers on Establishment in H.M. Dockyards and Numbers in Steam Factories in Certain Selected Occupations.*

	Establishment.		
	1850-51. (a.)	1860-61. (a.)	1872-73. (a.)
Shipwrights and apprentices	3,500	4,000	3,121
Caulkers	290	330	227
Joiners	525	610	450
Sawyers	362	342	76
Smiths and apprentices	758	876	606
Millwrights and apprentices	207	250	47
Labourers	1,786	2,280	874
Totals of all employed	9,621	10,850	6,410

	Establishment.				Additional Numbers Hired.	
	1880-81. (b.)	1890-91. (b.)	1893. (b.)	1900-01. (b.)	1880-81.	1893.
Patternmakers	21	19	27	35	34	85
Founders	35	25	39	52	57	177
Boilermakers	147	122	126	143	185	388
Smiths and hammermen	809	706	658	648	445	789
Coppersmiths	55	40	50	56	58	115
Engine-fitters and erectors }	308 {	177	148	220	509 {	1,090
Ship-fitters		95	215	235		566
Plumbers	43	41	40	45	6	65
Shipwrights	2,939	2,240	1,891	1,917	828	2,302
Joiners	509	426	361	372	285	608
Labourers	717	500	503	665	2,143	4,288
Totals of all employed	6,870	5,360	—	5,976	8,802	14,355

Note.—The numbers in the above table indicate the distribution among the occupations of the totals given in Table 2. Those marked with the same letters (a) or (b) or (c) are probably comparable. The changing numbers of hired men and the changes in classification make these statistics very difficult to use.

TABLE 3.—*Numbers in H.M. Dockyards and Steam Factories—Contd.*

	In Steam Factories.		In Steam Factories and Hired Men in Dockyards, 1872-73.
	1850-51. (c.)	1860-61. (c.)	
Patternmakers	43	73	36
Founders	69	147	63
Boilermakers and assistants	258	822	237
Enginesmiths and ham- mermen	115	133	467 (smiths) 53 (holders-up)
Coppersmiths	29	71	64
Fitters and erectors and assistants	332	550	583
Millwrights	19	35	—
Painters	5	7	31
Labourers	232	523	1,910 (unskilled) 1,141 (skilled)
Shipwrights	6	6	426
Totals of all employed	1,155	2,440	6,054

Engineers in Railway Shops.

In considering the records of wages of engineers and similar classes of workpeople employed by railway companies, we find that these records fall into two classes, (*a*) where the rates paid are similar to those paid by private employers in the neighbourhood, and (*b*) where scales of pay are in vogue, and wages are paid, depending on the length of service. In the case of (*a*), the rates for fitters, turners, smiths, patternmakers, ironfounders, brassfounders, brassfinishers, coppersmiths, platers, rivetters, and holders-up almost invariably change with the rates for similar workmen in private employ, and in the case of (*b*) very little change is apparent over a very long period. With the exception of Crewe and Swindon, both of which are almost entirely railway towns, falling under class (*b*), and of a few places where repair work is done, the railway shops are of class (*a*). Indications have been found in trade union reports that the local standard rates for engineers are paid in railway works at Derby, Wolverhampton, Horwich, Grantham, Hull, Gorton, and Miles Platting (Manchester District), Gateshead, Doncaster, Brighton, Stoke, Bury, Sheffield, Cardiff, Barry, and Newport. In the three latter places the rate paid is that for non-marine shops. At Belfast and Barrow a lower rate is paid than that obtaining in the shipyards and marine engineering shops. At Manchester the rate for machine shops is paid, and we are able to trace these back to 1871. At Glasgow the railway companies have frequently made changes with the general changes of the district, but there is no evidence to show whether this has invariably been the case, or that the rates have been the same. In some of these places, notably Derby and Wolverhampton, the

rate paid at the railway works is said to have decided the rate paid by private employers, *i.e.*, private employers have granted increases because the railway company has done so, but in the remainder the changes have generally been simultaneous and uniform with the agreed-to changes in the local standard rates.

Of these centres, the engineers' rates at Derby, Wolverhampton, Cardiff, and Sheffield are given in Part X of this Series.¹ Those for Gateshead are, in recent years, the same as prevail at Newcastle, also given in Part X. The rates for Hull are given on pp. 598 and 599 of Part XII.² The rates for other of the centres named, with some additional information for Cardiff and Sheffield, are given in the following table (fitters, turners, and smiths):—

TABLE 4.—*Trade Union Standard Rates of Wages for Engineers Employed in Railway Shops.*

	1864-70.	'71.	'72.	'73.	'74.	'75.	'76.	'77.	'78.	'79.	'80.	'81.	'82-84.	'85.	'86.	'87.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Sheffield....	—	—	32	34	34	34	34	34	34	32	32	—	—	—	—	—
Cardiff	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Newport.....	28	28	30	32	32	32	32	32	30	30	30	30	30	30	30	30
Bury	—	28	30	30	30	32	32	32	30	28	28	30	32	32	30	30
Stoke	—	—	—	—	—	—	32	32	32	30	30	30	32	32	30	30
Doncaster ...	—	—	—	—	—	—	30	30	30	30	30	30	30	30	30	30
Brighton ..	—	—	—	—	—	—	—	—	34	—	—	—	—	—	—	—
Horwich.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grantham...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	28
Manchester	—	30	32	32	32	32	32	32	32	30	30	32	32	32	30	30

	1888.	'89.	'90.	'91.	'92.	'93-95.	'96.	'97.	'98.	'99.	1900.	'01.	'02.	'03.	'04.	'05.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Sheffield.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cardiff	—	32	34	—	—	—	—	—	—	—	—	—	—	—	—	—
Newport.....	30	32	32	32	32	32	35	35	35	36	36	36	36	36	36	36
Bury	32	32	32	32	32	32	34	34	34	35	35	35	35	35	35	35
Stoke	32	32	32	32	32	32	32	34	34	34	—	—	—	—	—	—
Doncaster ...	30	30	30	30	30	30	30	32	32	32	—	—	—	—	—	—
Brighton ..	—	—	—	—	—	35	35	35	35	35	35	35	35	35	35	35
Horwich.....	—	—	—	32	32	32	34	34	34	34	—	—	—	—	—	—
Grantham...	28	28	30	30	30	30	—*	—	—	34	—	—	—	—	—	—
Manchester	32	32	32	32	32	32	34	34	34	34	34	34	34	34	34	34

* 124 Engineers rose 1s., from 33s. 1d. to 34s. 1d.

At Swindon there does not appear to have been any change since 1862. The average rate appears to have been 31s. 6d. per week, while the trade union minimum was 30s. until 1901, when it became 31s. 6d. Another return from Swindon gives the rates for various classes of workmen from 1880 to 1898 as follows:—Fitters, 32s.; turners, 32s.; millwrights, 34s.; planers, 24s.; slotters, 24s.; ironfounders, 30s.; brassfounders, 30s.; smiths, 32s.; strikers, 21s.; patternmakers, 36s.; labourers, 19s. With regard to Crewe we have practically no information, the Amalgamated Engineers reporting the average wages as 29s. 4d. in 1862, and 30s. in 1891; in 1893 the Society's minimum was 29s., and in 1899 27s.

¹ *Journal of the Royal Statistical Society*, March, 1905.

² *Ibid.*, September, 1905.

for fitters and turners, and 32s. for smiths. It is not unreasonable to assume that there cannot have been any noticeable changes in the ordinary rates of pay, or they would have been mentioned in the reports of one or other of the unions concerned.

Generally speaking, the rates for employees in locomotive departments of railways have changed with the general movements in the engineering trades, *i.e.*, have risen once or twice in the early "seventies," fallen in the succeeding depression, risen between 1880 and 1884, fallen in 1886, risen between that date and 1891, and risen between 1896 and 1901.

Miscellaneous Statements of Wages, &c.

Certain miscellaneous statements of wages or information about the condition of the industries now under consideration seem best published here. Brassey, *Work and Wages*, 1871, gives the following statement of average rates of wages paid to skilled workmen in a locomotive works, but does not mention the locality :—

	1859.		1869.	
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
Fitters.....	28	3·15	28	7·69
Turners	28	4·57	29	3·76
Braziers	28	6·85	28	7·06
Grinders.....	27	6	28	10·50
Smiths.....	28	5	26	10·35
Boilersmiths	31	8	30	4·5
Bricklayers.....	24	5·1	30	0·57
Saddlers	19	8	20	3
Forgemen	34	3	34	4·05
Painters	22	10	23	1·60
Moulders	29	4	28	5·50
Joiners, patternmakers, and } sawyers	24	6·18	24	4·95
Brickmakers	27	8·44	27	5·28

In *Lectures on the Labour Question*, 1878, p. 54, he says: "An eminent firm of shipbuilders said that shortly after the reduction of hours from 59 or 60 in 1871 to 54, there took place a rise of wages of $7\frac{1}{2}$ to 15 per cent."

Sir I. L. Bell, in his *Principles of the Manufacture of Iron and Steel*, gives the following statement of the percentage increase of wages in a large locomotive works in the North of England :—

	1850.	1874.	1881.
Fitters and machinemen....	100	135	119
Blacksmiths	100	141	123
" " " strikers	100	131	123
Joiners	100	151	140
Bricklayers	100	151	140

and he also states that mechanics' wages rose from 1850 to 1870 by 10 or 15 per cent., to 1873 by 33 per cent., and to 1880 by 30 per cent. In his evidence to the Royal Commission on Trade Depression, he considered wages then, 1886, were about equal to those of 1880.

The following statement comes from the *Commercial History and Review*, 1874, p. 4, where the author also states that wages rose in 1864-65 and fell in 1867-68:—

	1861.	1871.	Increase per Cent.
	s.	s.	
Labourers.....	18	21, 24	24
Moulders	24	28	17
Engine fitters	26	28, 30	12

More important, as being more continuous, are the statements found in the various reports of the trade unions, as these are often rough summaries of the movements of wages in several centres. The following are not exhaustive, and further research would probably result in a large addition, but they are valuable as a check on the index-numbers calculated from statements of rates prevailing at various dates and as aids to interpolation. To save space and for clearness they are here tabulated under the unions to which they refer:—

Friendly Ironfounders.

Date.	STATEMENT.
1847.....	"Having unemployed funds, our wages have not been depressed."
'55, July	Reductions accepted because of bad trade.
'57, December....	"Panic , reductions, against which attempts to resist have been useless." [Reductions took place in at least 15 centres in 1857-58.]
'66.....	Advises members not to make any further applications for increases of wages or reductions of hours. "For the past two years we have done well, and must now wait our time," the state of trade being "very critical."
'67, February { and March }	Employers taking advantage of the bad trade to reduce wages.
'67, March	"Reduction of wages in some of our largest branches."
'71, October.....	"Best state of trade ever recorded."
'72, December ..	Nine hours' day almost universally granted, without reduction of wages or strikes.

Amalgamated Society of Engineers.

Date.	STATEMENT.
1853, March to { June }	Several localities have obtained advances of wages, others trying for advances.
'55.....	"Severe depression in Lancashire."
'65-66	"Improvement in the rate of wages in our own and other trades in nearly all parts of the United Kingdom."
'70, July	"In many localities there have been advances."
'72	General movements for advance.
'79	Reductions all round.
'80.....	"In the matter of wages we are little in advance of fifteen years ago."
'80, March	"In several districts movements for advance commenced."
'81, March	Great change for the better in the shipbuilding districts.
'81, December....	"We have had [during 1881] less unemployed, rising trade, and advancing wages."
'82, February	"In a few weeks we may expect to be as in 1875 Wages are advancing everywhere."
'86, January	"Trade matters now in a disturbed state."
'88, August	"Wages advanced in many districts."

Steam-Engine Makers.

1862, October.....	Great depression in Lancashire.
'63	"Trade dull."
'65-66	Wages rising.
'67-68	" falling.
'69	Trade on the turn.
'70 to 1875	Wages rising nearly all the time.
'78	Notices of reductions.
'79.....	Reduction taken effect. "From 1872 to 1876 our trade was satisfied with rises of 2s.; in 1878 we submitted to reductions of 2s."
'79, November....	Trade beginning to revive.
'81-82	Continually advancing.
'82, December....	"There are no towns where 1877 wages do not rule again."
'83, December....	The previous wages were obtained, and then some places got further advances. Now "rumours of reductions."
'84.....	Resisting reductions.
'85	No reductions accepted; trade dull.
'86.....	Reductions all round.
'87.....	Revival commenced.
'88-89	Advances generally.
'90	Fewer advances.
'92.....	Reductions in marine centres.
'93	"

CORRIGENDA AND ADDENDA TO A. TRADE UNION STANDARD
RATES.³

Inquiries undertaken since the first article dealing with trade union rates have resulted in additional material being found, and in corrections of many of the rates given:—

PAGE

- 109 Newcastle shipwrights:—*Add* "In 1833, 4s. per day. There had been no decline during the previous four or five years."
Sunderland shipwrights:—*Add* "In 1833, 4s. per day. Had not declined more than 6d. since the war."
- 110 Tyne shipyards:—Rivetters, 1872. *For* "30s." *read* "31s."
Caulkers, 1872. *Delete* "28s."
Holders-up, 1872. *For* "28s." *read* "24s."
Tyne boilersshops:—*Delete* "(a)."
Rivetters and caulkers:—1872. *For* "32s." *read* "29s."
Holders-up:—1872. *For* "25s." *read* "24s."
- 111 Tyne shipyards:—Angle smiths, 1896. *For* "33s. 6d." *read* "35s. 6d."
1903-04. *For* "97½" *read* "92½."
Holders-up, 1892-1901. The rates should be 6d. lower.
Painters, 1884. *For* "28s." *read* "27s."
This reduction lasted four months only.
Tyne engineshops:—Patternmakers, 1896. *For* "35s. 6d." *read* "36s. 6d."
1903-04. *For* "37s." *read* "38s."
Tyne boilersshops:—Light platers, 1897. *For* "38s." *read* "38s. 6d."
Rivetters, caulkers, and holders-up, 1897-1904. The rates should be 6d. higher.
- 113 Middlesbrough. Shipwrights:—1902, 1903-04. *For* "40s." *read* "38s. 6d."
Fitters, turners, smiths:—1903-04. *For* "36s." *read* "35s."
Planers, 1903-04:—*For* "33s." *read* "32s."

³ *Journal of the Royal Statistical Society*, March, 1905.

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- 112-3 Sunderland. Amalgamated Society of Engineers:—*Insert* “1875-76, 33s.”; *for* “33s. in 1877,” *read* “32s.”; *insert* “1878, 32s.; 1879-80, 31s.; 1881, 33s.; 1882, 35s.; 1883, 37s. (but many were on strike); 1886-87, 30s.; 1888, 32s.; 1889, 34s.; 1890-91, 35s.; 1892, 33s. 6d.”
Shipwrights:—“*Insert* 1874-78, 36s.; 1879-80, 30s.; 1883, 37s.; 1884-85, 34s.; 1886-87, 32s. 6d.; 1888, 34s.; 1889, 34s. 6d.; 1890-91, 35s.; 1892, 31s.” and *omit* the rates given from 1885 to 1892.
- 114 Table 2 (c):—All the rates for rivetters, caulkers and holders-up in boilerships previous to 1897 are 6d. too high.
- 116 Clyde shipwrights:—1886-87. *For* “31s. 6d.,” *read* “30s. 4½d.”
- 118 Aberdeen boilerships:—*For* “angle smiths,” *read* “heavy platers”; *for* “heavy platers,” *read* “light platers”; *for* “light platers,” *read* “caulkers”; *for* “caulkers,” *read* “rivetters.”
- 119 Hull boilerships:—1892 and 1893-95. *Instead* of the rates given, *read* those given for shipyards. Boilermakers and iron shipbuilders have, with a slight exception, been paid at the same rates since 1876. See the rates given at pp. 598—599. *Journal*, September, 1905.
Ship angle smiths:—1898. *For* “43s.,” *read* “42s.”
Manchester boilerships:—1889-91. *Delete* “no change, &c.”
Further inquiry has shown that a reduction of 2s. took place in 1886, and increases amounting to 4s. took place between 1888 and 1893.
- 120 Southampton caulkers:—1893-95. *For* “34s. 9d.,” *read* “34s. 6d.”
- 122-3 Bradford:—1860, 1861, 1863. *For* “23s.,” *read* “22s.”
The same rate is also given for 1862.
- 123 Bristol:—1863. *Insert* “smiths, 30s.”; “platers, 35s.”; “rivetters, 29s. 6d.”; “holders-up, 20s.”
1866. *Insert* “platers, 36s.”; “holders-up, 18s.”
These are given by the same authority, *Returns of Wages*, as gave the rates for 1855-61.
- 124 London Amalgamated Society of Engineers:—1882. *For* “36s.,” *read* “38s.”
Blackburn (3rd line):—*For* “fitters,” *read* “smiths.”
Bradford patternmakers:—1885. *For* “29s.,” *read* “30s.”
Derby ironmoulders:—1880. *Dele* “{.” The upper line belongs to “Bristol patternmakers,” which should be inserted.

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- 125 Belfast ironmoulders:—1902, 1903-04. These reductions did not take place, and the rates are still "38s., 40s."
 Birkenhead joiners:—1892. For "32s.," read "33s."
 Ironmoulders:—1888. For "36s.," read "34s."
 1890-91. "36s.," "38s."
 1896. For "36s., 38s.," read "38s."
 1897. For "38s., 40s.," read "39s., 41s."
 Bradford ironmoulders:—1896. For "34s.," read "36s."
 1898. "36s.," "37s."
 1899. "37s.," "38s."
 Patternmakers:—1896. For "34s.," read "36s."
 1898. "36s.," "37s."
 1900. "37s.," "38s."
- 129 *. For "78" read "71."
- 131 Belfast shipwrights:—1892. For "34s.," read "35s."
 1898, 1899-1900. For "37s. 1½d.," read "38s. 3d."
 1903-04. For "38s. 3d.," read "37s. 1½d."
 Cardiff. Shipwrights:—1893 to end. For rates given, read "1893-96, 39s.; 1897-1904, 40s."
- 133 Mersey shipjoiners:—For "1853-58, 36s.," read "1845, 24s.; 1854, 27s.; 'before 1858,' 36s."
- 135 Manchester. Steam engine makers:—1886. For "— and + 2s.," read "— 2s."
- 136 London engineers:—For "rising to 24s.," read "rising to 42s."

 II.—Unconscious Assumptions in Economics.

By the Rev. W. CUNNINGHAM, D.D., D.Sc.

[Address to the Economic Science and Statistics Section of the British Association, South Africa, 1905.]

AMONG the members of any such gathering as a meeting of the Economic Section of the British Association there are likely to be some who come to give information and some who come to get it. In the latter class may, I am sure, be included all those *habitués* of the Section who have seized the opportunity which the visit of the Association affords with the view of learning something about the present condition and prospects of the enormous territory which we hope to be able to traverse. It may not be so to the same extent in all Sections. Those who come from the great chemical and physical laboratories of Europe may have much to say as to the

result of experimental investigation, which they can carry on under more favourable conditions than are at present generally available to students in South Africa. But in Economics there is no room for experimental inquiries consciously undertaken in the interest of the advancement of science. The issues are too serious; the conditions on which they depend cannot be arranged for the convenience of the inquirer. Economics is a science of observation, not of experiment; and we are fortunate to find ourselves in specially favourable circumstances for noting and appreciating the results of investigations which have been made by skilled observers on the spot.

While we gratefully acknowledge the pains that have been taken here in preparing papers for this Section, we may yet feel that the task we are setting ourselves as visitors is not an easy one. There are few harder things in this world than to preserve a genuinely receptive frame of mind, and hold the judgment in suspense when we are brought face to face with the unexpected. There are so many assumptions we all make, and so many canons of criticism we have habitually accepted, that are not easily laid aside, even temporarily. "The worst use of theory," as a great Cambridge professor has warned us, "is to make men insensible to fact," and the danger may be most real when we are not aware of the influence exercised by some hypothesis which we habitually make.

I. The popular discussion of economic problems teems with unconscious hypotheses, which tend to obscure the facts of the case. Mill described political economy as a science which, assuming the facts of human nature and of the physical world, considers the laws of the production and distribution of wealth. But what are the facts of human nature which we may legitimately assume? At first sight we are inclined to take for granted that human nature is much the same all the world over. The late Professor Jevons gave clear expression to this view. "The laws of political economy," he says, "treat of the relations between human wants and the available material objects and human labour by which they may be satisfied. These laws are so simple in their foundation that they could apply, more or less completely, to all human beings of whom we have any knowledge." He adds: "I should not despair of tracing the action of the postulates of political economy among some of the more intelligent classes of animals."¹ It has seemed as if in the march of progress modern industrial conditions must inevitably be introduced in backward countries, and that they would everywhere result in moulding individual aims and character on the same lines. Each individual is to some extent affected by his environment; and it has been supposed that the keen competition and struggle for existence, which in one form or another dominates economic life in all parts of the globe, would make for the survival in all areas of men of the type with which we are familiar in business circles at home. In England there is on the whole a condition of free exchange, where

¹ W. S. Jevons, *Principles of Economics*, p. 196.

each individual puts in his quota of service to the community and bargains for payment. His success in the management of land is rewarded by an increase of rent; his enterprise in investing his capital, by larger profits; his diligence and skill as a workman, by the wages he draws. The man who is self-disciplined enough to follow routine work habitually for the sake of reward, and whose ambitions lie in the direction of better paid and more responsible service, is the normal man of such a society. But it must be remembered that modern civilisation is also producing another class; whatever the force of social environment may be, it does not, as a matter of fact, form each unit of the rising generation on the same type. There are men who do not fit readily into our modern system; they dislike the monotony and stationary life which steady industry imposes, though they may be able to work well and hard when the fit takes them. The tramp of the American continent is as much the product of existing industrial conditions as the ambitious leader of an organised body of skilled artisans. The "ins and outs" of Great Britain have characteristics which may be described as nomadic.² Economists recognise that the fluidity of labour is one of the assumptions that can be fairly made in regard to modern society.³ The conditions under which labour is fluid give opportunity for the growth of a half-employed and migratory class, who are, as a class, a tax upon the well-being of society. It is the greatest of all problems in the Old World to see how the educative influence of society can be brought to bear so that it shall rear as much as possible the sort of man who is "capable of standing on his own feet and of contracting when and how to render services to those who are willing to offer services he wants in return." The question, What is to be done with those who cannot and will not thrive on this system? is constantly presenting itself in new forms. For our present purpose it may suffice to recognise that this question exists, and that even when the conditions of race and history and social surroundings are similar they do not produce one type of individual only. Under these circumstances we can no longer take for granted that human aims and activities are becoming closely similar in all parts of the globe, even for economic purposes. The individual estimate of the utility and disutility of labour at any given moment may often be very different from that which the economist would assume to be the natural conclusion. It is obviously absurd to suppose of vast numbers of our fellow-creatures that they are in the habit of acting in accordance with what appears to be common-sense to the average travelling Englishman, but they need not necessarily be fools on that account.

II. What is true of unconscious assumptions in regard to individuals personally also holds good for the mechanism of society; we cannot assume that it works everywhere in the same way. The Classical Economists were inclined to limit their investigations to the areas and regions where free competition

² J. C. Pringle, in *Economic Review*, xv, 60.

³ W. Bagehot, *Economic Studies*, 21.

has been dominant, and thereby to exclude from consideration all those important problems which arise from the contact of individuals of two races, with different economic habits and ideals, upon the same soil. But even if the ages and areas of free competition could be cut off from the rest of the world, and we fixed our attention exclusively on this single plane, we should not find simplicity and uniformity throughout the whole region. The habits of business practice and labour organisation differ in different lands: the banking system in Scotland is by no means the same as that in England, and a form of currency which finds favour in one is illegal in the other. There is also a want of complete conformity between the Eastern and the Western States in this matter; we cannot argue directly from the one to the other. When this is true about the medium of exchange, it is obvious that the differences between one highly advanced community and another in regard to the terms on which labour is carried on, or the method in which land is managed, will be even more striking.

The great difference in the working of the mechanism of society, as we know it in England and as we find it in other lands, was the chief impression which was left on my mind on the occasions when I have had the opportunity of travelling far afield. A quarter of a century ago it was my good fortune to spend a few months in India, and to get some insight into the extraordinary contrasts between Britain and her great Dependency. At that time many of the changes which had revolutionised English industry and internal traffic were beginning to make themselves felt throughout India. Railway communication was being opened up in all directions, and cotton spinning was carried on at mills in Bombay, and in Hyderabad in the Deccan. The results of the age of mechanical invention had begun to invade the changeless civilisation of the East. Still the persistence of the old order was also noticeable. The village community, as an exclusive group, with the headman who supervised all transactions with the outer world, forced itself upon my attention when I attempted to hire a pony to visit the cave at Karli. I passed a granary in Kathiawar where the officials of a native State were measuring out the crop and collecting the revenue in kind. The highly-developed gild system at Ahmedabad was the very image of much that I had read of regulated industry in mediæval towns. On every side it seemed as if the survival of the past had been preserved in the East, so as to make the story of bygone ages in the West alive before my eyes. On the other hand, the transition from the old to the new, which had gone on steadily in England for centuries, seemed to be ready to sweep over Hindustan like a flood, that would disintegrate existing institutions, while it showed little constructive power. And when I heard discussions on the incidence of taxation, the pressure of the salt tax, or the impossibility of imposing an income tax, I at least realised that the conditions were strangely unlike those of which a Chancellor of the Exchequer would have to take account in England. The mechanism of society is entirely different; the expedients which

would make for convenience and equality and inexpensiveness in England would not necessarily be feasible in India at all.

Five years ago I had occasion to reside for some months in the United States, and once again I came away with a strong impression that the mechanism of society was very unlike that with which I am familiar in England—the differences were more subtle, but not less real, than those between English and Indian economic life. Throughout the States there are few vestiges of past history; the alleged relics of Norse invasion have disappeared under the solvent of critical investigation; and though frontier life has been till lately an abiding factor in American civilisation, comparatively little influence has been exercised by the native races on the economy of America to-day. The English stock, with grafts of many kinds, has had a clear space in which to grow. In India the conflict of the past and the present seemed to be the dominating condition, but in America there had been room for the development of a new country pure and simple, unhampered by the traditions and customs of bygone days, except in so far as their wisdom was confirmed in present experience. Hence, on the other side of the Atlantic the practical economic problems as to the development of a large and wide territory are presented in their simplest form. It is there that we can note most clearly the lines on which modern industry and commerce develop, with the full employment of modern appliances and the minimum of control from traditional habits and institutions.

There is one economic conception which is deeply ingrained in English habits, and which seems to me to have no corresponding hold in America—that of the market. Its former importance as the centre of trade in many towns is sufficiently vouched for by the space that it occupies, and its legal history takes us back to the very beginning of urban life in England. In mediæval opinion a sale in open market, where buyers and sellers met together publicly, had all the guarantees of an honest transaction; it was important both as evidence of the sale and as an indication that the bargain was above board and fair, since there was one price for all alike. Private transactions which did not come into the market—forestalling and such like—were viewed with suspicion; they were supposed to be methods by which some wily person drove an extortionate bargain or gained at the expense of others. And, in modern times, organised markets, where there are facilities for public information, are common, not only in every locality, but in a great variety of trades. Commercial transactions in the United States seem to have sprung up and developed on rather different lines; markets are frequented in the country towns of Lower Canada, but there is little sign of them in the cities of the States. It almost seems as if commercial practice there were based on the habit of “having a deal” privately, and took its character from transactions outside a market rather than from the higgling which occurs where many buyers and sellers meet. There can at least be little doubt that the methods of bargaining which are current in the States have been favourable to the building up

of great organisations—both the industrial organisations which control all parts of some industrial process, and the trusts which monopolise some line of business. The lack of public markets, either for produce or for goods, at various stages of the process of manufacture, has apparently rendered it easier to form great monopolies in America than it would have been in Great Britain. Indeed, it may almost be said that the struggle for existence among business rivals takes a different form in the two countries. As Professor Jenks points out, the whole terminology which is habitually employed to analyse the movements of prices in England is inapplicable to the United States. "The normal price of economists has been based upon cost of production under a system of competition among small capitalists." But in such an industry as sugar-refining in the United States, this condition does not hold good. "There is no normal level of competitive price based on the cost of production."⁴ The whole industrial organisation takes other forms, and the mechanism of competition does not work in the fashion which English economists would assume. We have need to be doubly on our guard, since unconscious assumptions may not only affect our powers of observation, but may also be present to colour the language we use in describing unfamiliar phenomena.

III. It is not easy to overrate the services which the Classical Economists rendered in their day to the progress of Economic Science, owing to the clearness of the conceptions they applied to the limited field they studied, and to the accuracy they endeavoured to introduce in regard to the use of familiar languages. It was their misfortune, rather than their fault, that their manner of treating individual human nature and the mechanism of society has given some excuse for the popular misuse of their teaching. In the public mind, principles which had been legitimately put forward as convenient hypotheses for the investigation of a particular sphere have been transmuted into axioms of universal applicability. But when we turn to other subjects of economic inquiry, the limitations, and consequent defects, of the Classical school become more apparent. The idea of the growth of society was not easily brought within the limits of a system which makes so much use of terminology borrowed from physics. Some of the precursors of Economic Science in England had treated national life as organic, and had relied on biological conceptions. Hobbes had devoted a chapter of the "*Leviathan*" to the nutrition and procreation of States;⁵ and Sir William Petty, who had held the Chair of Anatomy in the University of Oxford, entitled an important statistical work "*The Political Anatomy of Ireland*." But another and less fruitful habit of thought existed side by side; the Mercantilists, in discussing the benefits of commerce, wrote much of the balance of trade; and the physical analogies they introduced—especially the notion of equilibrium—

⁴ J. W. Jenks, *The Trust Problem*, p. 141.

⁵ Pt. ii, ch. xxiv, Camb. Univ. Press Edition, p. 175.

exerted a dominating influence over the form which the science took in the hands of the Classical Economists. These last were so much absorbed in the discussion of the mechanism of exchange and the mechanism of society, that they failed even to recognise that it is essentially organic. As has been well said, "the Classical Economists belonged to the pre-Darwinian age. We differ from them in our whole view of life and of the ends of life—in our whole mental method as well as in our possession of the practical experience of the last sixty years."⁶ It is only in recent years, when we have passed beyond the arbitrary limits they accepted and imposed, that it has been possible to enter on new fields of research. Carl Bücher⁷ has brought out the importance of the relations which subsist between economics and anthropology, and Thorold Rogers proved himself a vigorous pioneer in the interpretation of history. In this fashion the whole range of the phenomena of economic life, in its earlier as well as in its later forms, is being brought within the sphere of scientific treatment as exhibiting various stages of growth. The men of the classical period of Economics, who devoted themselves to the study of new countries, were not in a position to deal with the subject properly, and their writings seem singularly lacking in grasp. Times have changed since their day, both politically and economically. Lord Brougham wrote at a date when responsible government was undreamed of; he pleaded for the benevolent treatment of dependencies, and his language is wholly inapplicable to the great self-governing nations, which have been formed partly under English influence and partly through English neglect. But none the less is his writing, and that of some other enthusiasts for the development of the colonies, of abiding value as a monumental warning against a sort of pseudo-philosophic habit of mind. There is an underlying assumption that the one type of colony he had in mind was the only one worth taking into account; he was really thinking of a particular case, but he allowed himself to write of it in general terms, and thus to give an air of philosophical detachment to his remarks.⁸ In the year 1803 there were many circumstances that gave prominence to questions connected with the West Indies; the agitation in regard to the slave trade was one, the trade rivalry between the French and Spanish and English islands was another. Brougham was thinking of the West Indies; all that he said of the dependence of these little islands on the Mother Country for defence, of the necessity of the colonists relying on English help to repel prospective invasions and annexation by France or Spain, was true enough; it might well lie at the basis of the economic relations between the planters and the Government in England, but it has no bearing on the actual conditions of the great Continental countries

⁶ C. L. Garvin, "Principles of Constructive Economics," in *Compatriots' Club Lectures*, i, 2.

⁷ *Arbeit und Rhythmus*. His *Industrial Evolution* has been translated by Dr. S. M. Wickett, and I desire to acknowledge my indebtedness to the volume.

⁸ Lord Brougham, *The Colonial Policy of European Nations* (1803), i, 108.

which are still called colonies, and which are at least under no anxiety as to their ability to repulse a foreign invader.

The greatest of all Brougham's contemporaries who wrote on the art of colonisation was not exempt from a similar defect; he professed to write in general terms. Few names are more deserving of honour than that of Edward Gibbon Wakefield, and there is something very extraordinary in the contrast between the strong practical sense which distinguished him as a man of action, and the doctrinaire spirit which pervades his writings. He fell into the error which characterised the Classical school when they dealt with practical problems, and generalised from the special conditions of his own day.⁹ There was, to Wakefield's mind, one, and one only, method of successful colonisation; all others were to be condemned in so far as they departed from the true system which he had devised. Wakefield, too, was the victim of unconscious assumptions; the type of colony he had in mind was a white man's country, in which raw produce might be obtained for export. He showed under what conditions Australia, Tasmania and New Zealand might be most successfully developed;¹⁰ but his scheme is certainly unsuited to tropical regions, and it need not necessarily be preferable to the alternative of developing a community on the lines of subsistence farming. On this point at least we can make a very definite comparison: Virginia, Carolina, and Georgia have all been colonies which raised such commodities as tobacco, and rice, and cotton for export; they started more rapidly than the New England colonies, where the settlers were engaged in subsistence farming; but as we look at these States at the present time, we can hardly say that the type of community to which Wakefield devoted exclusive attention is that which has given rise to the most healthy and vigorous economic life.

Even Adam Smith, in writing of the growth of societies, fell into a similar error: he passed out of the region of actual life, where he showed himself such a master, and attempted to discourse in a pseudo-philosophical strain on the manner in which countries ought to have developed, but never had. He allowed himself to elaborate an account of a supposed natural progress of opulence, which might have occurred in an isolated State. There is scope for a pretty play of fancy and much elegant writing in such a theme, but no attempt was made to show that isolated States ever do develop, so long as they remain isolated. Much may be said for the view that the chief stimulus to development is supplied by contact with communities on a different plane of economic conditions. In the history of England there are long periods of apparent stagnation and decline, and occasional epochs of rapid advance; but whether in the days of the Danes or the Norman kings, of the Edwards or

⁹ Cunningham, *Growth of English Industry and Commerce in Modern Times*, p. 740.

¹⁰ E. G. Wakefield, *Art of Colonisation*.

the Georges, the opening up of new trading relations has been the impetus to internal development. Economic experts are not even acquainted with philosophical principles as to the manner in which communities ought to develop, and therefore we are not justified in pretending to train up a young country in the economic way it should go.

IV. Every undeveloped country presents a network of fresh problems, each of which must be studied separately; but they must also be considered as interrelated and viewed in their mutual dependence. There is a mass of experience in the past which may be drawn upon as a help; we may appropriate it, and save ourselves the expense of buying fresh experience in a costly fashion; but in order to reap the fruit of human experience in the past we must be prepared to take a great deal of trouble; it is not lying about for anyone to pick up at haphazard. The teachings of history as to the rise of great nations from small beginnings, or as to the causes which have led to premature decay, do not lie on the surface. Since the days when Lord Burleigh recognised that the mineral wealth of the Spanish conquests in the New World did not really add to the strength of the monarchy at home, there has been a tendency to disparage extractive industries. "Moile not too much underground," said Lord Bacon, "for the hope of mines is very uncertain, and useth to make the planters idle in other things";¹¹ and Adam Smith does not at all dissociate himself from this view.¹² It appears to have been thought that mining for the precious metals, however attractive it might be for a time, could never be a secure foundation for the building up of stable society. But after all it would be wise to discriminate a little before we adopt this conclusion, and to examine the condition of different parts of Spanish-America separately.¹³ The richest mines of all, those of Peru, were situated on the arid slopes of the Andes, where cultivation was impossible, and there were insuperable obstacles to the planting of well-ordered and prosperous communities; but very different results were achieved in Mexico. These workings occurred on a plateau where cultivation and settlement were possible, and the wealth which was obtained by mining reacted on the prosperity both of agriculture and manufactures. Extractive industry served to give a stimulus to that varied life, partly urban and partly rural, which is necessary for a community that hopes to take a real and independent place in the civilised activities of the world. It is foolish to jump to the conclusion either that mining gives a feverish and unhealthy stimulus, or that the Spanish system of regulation was incurably bad; we ought to distinguish carefully, and to try to learn from Spanish experience, both in South and in Central America, what are the conditions under which mining for the precious metals can

¹¹ *Essay on Plantations*.

¹² *Wealth of Nations* (Nicholson's Edition), 71, 73.

¹³ Merivale, *Colonisation and Colonies* (1861), 25, 27.

be pursued so as to be not merely of temporary, but of permanent advantage to the welfare of the community.

In fact, we must remember that the experience on which we rely in regard to economic growth has been obtained, not by experiment in a laboratory, but by observation in the world itself. The investigator in a laboratory can note all the conditions under which an experiment is conducted; he can be certain that under the same conditions the same result can be secured over and over again. But in the world of political and economic activities we never find the same conditions repeating themselves; the fundamental inquiry must always be, How far were the conditions of some growing community in the past similar to those of some growing community to-day? How far are they on all fours, so that we can argue from one to another directly? Sometimes we may get a very close analogy, and instructive comparisons may be possible; but even when the conditions are very different, when there is hardly any close parallel, we may still get a suggestion as to a mode of development that might prove fruitful or as to a danger which it may be well to bear in mind.

There is pleasure in completing, so far as the limits of time and energy allow, an empirical economic investigation; but to those who have any vigour of mind at all there is keener delight in seeing new fields of possible inquiry opened up. It is very enjoyable to renew acquaintance with an old difficulty in a fresh form, or to find that some question which seemed to be settled is forcing itself clamorously on our attention for reconsideration; and hence we have, as economists, set out for our too hurried visit here with eager anticipation. The conditions of South Africa seem to be very different from those of any other part of the world, and therefore every particular economic problem presents itself in an unfamiliar aspect. There has not been such a clear field for the working out of new ideas as was presented in the great West, or even in Australasia; and all questions as to the opening up of the country and the economic aims and aspirations of the settler are necessarily more complex. There may not be the sharply defined conflict between the old and the new which renders British India such a fascinating field for study, but the African problems are not simplified on that account. It is, rather, true to say that there is additional complication with regard to all industrial activity in a land where the natives have not been schooled to regular habits of work by the discipline of a high traditional civilisation. As passing tourists we can obviously make little progress in understanding how these practical difficulties are to be solved, but at least we hope to learn to know better how the questions ought to be stated. We shall have our reward if we carry back with us as a cherished possession a not wholly unintelligent interest in the great economic problems which must be worked out in South Africa.

III.—*The Future of Statistics.* By J. G. MANDELLO.

[Read at the International Statistical Institute, Tenth Session, 1905.]

IN discussion, or speculation on the probable future of statistics, we are confronted with the examination of a series of questions which may conveniently be arranged under the following headings¹ :—

1. The probable future of general statistical theory.
2. The development of methods for the arrangement and suitable expression of series of numbers founded on accurately collected data by means of various types of curves characteristic of the numerical frequency of distribution of national phenomena.
3. Progress in the technique of the collection, tabulation and calculation of statistical data.
4. The improvement of methods for securing the comparability of statistics.
5. The publication of statistics and its organisation.

We propose to deal in the most cursory way with the topics numbered 1—4, despite their obvious importance, and to dwell more particularly on the fifth and last point, although its importance may appear merely formal.

(1) A systematic development of the theory of statistics seems to be the immediate and urgent need of our science. Statistics has become the most frequently used (and misused) weapon in nearly all fields of economic, social, hygienic, &c., policy. The investigation of questions of economics, sociology, and political science is done with the aid of figures, and decisions are taken under the auspices of statistics. The aid of statistics is also claimed as supplying a delicate instrument of research in the investigation of biological problems of great importance. Thus, whether regarded from the practical or theoretical standpoint, a sure and certain theoretic foundation for statistical science is a primary necessity.

Nevertheless, we must, with regret, admit that the old criticism of Knapp² is valid even to-day.

The use of figures for purposes of argument, without any clear comprehension of the true meaning which they convey, the almost entire neglect of casual nexus, correlation and inter-dependence generally lying behind; the absence of the critical spirit, which carefully states the boundaries of what may be known through or proved by statistics, are the characteristic features of many statistical investigations, and of even more thinking and arguing

¹ Without any claim to a scientific classification.

² “Es ist ihr (der Statistik) häufig nur darum zu tun, dass gerechnet wird, weniger darum, dass berechnet wird, am wenigsten darum, was berechnet wird. Sie hat sich davon entwöhnt, zuerst sich klar zu werden, was man untersuchen will, und es fehlt ihr deshalb so vielfach der Trieb zu fragen, welche Bedeutung diese oder jene Grösse für die Untersuchung hat.” Knapp: *Über die Ermittlung der Sterblichkeit aus den Aufzeichnungen der Bevölkerungsstatistik*, Leipzig, 1868, p. 71.

done with the aid of statistics. Still, there are many encouraging signs to show that real progress in statistical theory may be anticipated. The work done by Levasseur and de Foville, &c., in France, by Volterra, Barone, &c., in Italy, by Knapp, Lexis,³ Bortkiewicz, &c., in Germany, and notably by Galton, Edgeworth, Pearson, Bowley, Yule, Weldon, &c., in England, is fundamental for a new theoretic start of our science.

Still there is no reason to suppose that in future less progress should be made or that the building up of a coherent statistical theory should not be completed.

It is very doubtful, however, whether the progress of theoretic knowledge will ever exert much influence on the great mass of public opinion. The public will probably continue to make unscientific use of the figures and abuse the hard-earned produce of the statistician to the support of private interest and party prejudice.

It is, and will remain, the bias of untrained minds to satisfy themselves with the figures brought to the surface by the ever-increasing stream of statistics, and to reject all sorts of theoretic speculation.

(2) It is a well-known fact that owing to the limited power of our minds we are unable to grasp the real significance of great masses of figures, and in consequence are compelled to resort to the employment of what may be termed "shorthand expressions" signalling the chief characteristics of the given group of numbers. Hence arises the necessity for the use of the various kinds of "mean." But a great deal of statistical work is even nowadays carried on with the use simply of the arithmetic average or so-called "weighted average," or other averages, the true significance of which is unknown to the reader. No sooner, however, is the necessity for the use of characteristic expressions admitted, than the various ways of arranging statistical data in groups and series must be examined, and the most convenient methods for calculating them examined, and their true nature and meaning clearly established.

Again, the arrangement of statistical data in groups immediately suggests their expression graphically, and thus, aided by the higher mathematics, we are enabled to discover certain types of curve to which large classes of natural phenomena conform, and which supply suggestive moulds within which to try and fit fresh numerical data.

For these applications of statistical science we are chiefly indebted to the modern English scholars mentioned above.

We may be pretty sure that all progress in this direction will

³ Tschuprow (*Die Aufgaben der Theorie der Statistik. Jb. f. Ges. Verw. u. Volksw. im D. R. (Schmoller)* XXIX, 2, 1905) very rightly claims, that the theory of statistics starting from Quetelet and brought into harmony with the admirable work done by Lexis, as regards the rôle of probability in statistics, ought to be extended to other fields than mortality, where Knapp, Lexis, &c., have hardly left anything more to be done.

leave the general public unaffected. They will remain indifferent to the "skewness of curves" and "criteria of fitting," though perhaps it is not too much to hope for some measure of comprehension of the different kinds of "mean," and an appreciation of the meaning of various forms of dispersion. On this account a general understanding as regards "termini technici" and "formulae," at present entirely wanting, is highly to be desired. We would submit that, at a later stage, it would be a useful work for the International Statistical Institute to bring about an *international agreement for the uniformity of statistical measurements*.

(3) The technique of collecting, tabulating, and calculating of statistical data is probably the most developed part of our science. This is the peculiar province of the professional statistician. The admirable work done by statistical officers of every kind has developed technical methods and skill to an exceedingly high pitch. The same may be said of the work contained in most of the papers printed in the *Bulletin* of the International Statistical Institute.

In this connection there yet remains the need of a higher degree of uniformity in the application of identical methods, but remarks on this point are more suitably reserved for our discussion of the fourth heading.

(4) The non-comparability of large classes of statistical data has ever been and yet remains the weak spot of statistics. Though the progress in this direction has been slow, what progress there has been is entirely due to the unceasing efforts of the International Statistical Institute, of its Committees, and its individual members.

The admirable papers dealing directly with the question of statistical comparability which have appeared in the *Bulletin* have powerfully promoted the object they had in view. Among these papers we may mention those of Bateman, Bertillon, Bodio, Bosco, Craigie, Evert, Ferraris de Foville, Hadley, Körösy, Levasseur, Milliet, Mischler, Neymarck, Rasp, Starke, Thirring, de Vargha, Verkerk-Pistorius, Würzburger, Yerschow, Yvernès.⁴

Beside these we have to mention the International statistics themselves published by Berg, Bodio, Kiaer, Körösy, Strebitsky, Tisserand Yvernès.

Still, the very essence of all this work, its critical part and its constructive part, *i.e.*, the propositions made, show how very far we are from being able to compare statistics on an international basis.

⁴ For international statistics see Mischler: *Die internationale Statistik, Handbuch. d. Staatswiss.*, 2 Ed., vi, pp. 1056 and 1057. There is an excellent, short, but impressive sketch of the history of international statistics in Körösy: "Bericht über die internationale Statistik der Großstädte." *Bull. Inst. int. de Stat.*, vi, 1, pp. 301—6. Amongst the papers received before the opening of the Tenth Session of the International Statistical Institute there are two extremely interesting ones dealing with the comparability of statistics. These are: March: "Recensements industriels et statistiques du chômage," and Schloss: "International Comparison of Workmen's Wages."

The remarks, for instance, of MM. Juraschek and Fahlbeck⁵ at the Eighth Session of the Institute at Budapest, which could be coupled with the judgments of many other competent critics, clearly show that the comparability of statistics remains as to the greater part a desideratum.

The reasons for this are not, as may be supposed, the non-existence of an international statistical office and of an international statistical year-book, although the ever-recurring wishes for such are quite legitimate. The incomparability of statistics is really due to the fact that statistics are intimately connected with national institutions, and that the purposes served by statistics vary with the national differences in institutions and circumstances.

(5) The best outward test of the growth and progress of statistics consists in the immense number of statistical publications, increasing at a progressive rate from year to year. This is such an obviously well known fact that an attempt to prove it by special statistics might be considered superfluous. Statistical offices of various kinds are publishing in print more and more statistics, and all sorts of other offices do the same. The tendency to publish statistics has become such a strong one that official duties seem to be inseparable from it; statistics are the best form in which to bring the fact of having done official work before the public. But this tendency is correlated with the increase of labour resting upon all sorts of officials. A multiplication of duties naturally does not imply a higher degree of efficiency in performing them, and, under the increase of expenditure for labour to draw up the statistics, and for printing them, the real official work very often suffers.

In the meantime the demand for statistics is ever increasing. There is of course a general mistrust of statistics, and if what is desired to be proved is not proved by them, then people say that "figures lie," forgetting how often "liars use figures." Still, there is an astonishing popular superstitious connection with figures; they are considered *the* argument, the unimpeachable statement of facts, and it is generally forgotten how carefully figures have to be handled, how critically they ought to be weighed and estimated, and how easy it is to misinterpret and misuse them. But it is an undoubted fact that the demand for statistics is rapidly growing. All the conflicts of economic, social, and political interests tend to be decided by the aid of statistics.

The number of citizens wanting to take part in many public or local affairs, and judging them on statistical grounds, is increasing.

⁵ "M. Juraschek démontre, avec exemples à l'appui, que les données fournies par les Bureaux de statistique sont, sous beaucoup de rapports, incomparables et que souvent elles ne peuvent même être fournies par les Bureaux sous une forme réellement comparable . . . M. Fahlbeck: . . . Mais, comme nous le savons, la plupart de ces données ne sont pas comparables. Les mots et les désignations sont les mêmes, mais pas les choses qu'elles désignent . . ." *Bull. Inst. int. de Stat.*, XIII, 1 (Budapest), pp. 142 and 143.

The number of topics for which statistics are required is growing; and so is the demand for more details and more combinations of them. Authors, the Press, and the general public are voracious consumers of statistics, and although the yearly output is large, one hardly hears that many people are satisfied by what is offered to them. They always want the elucidation of other points than those to be found in the volumes of statistics; the data therein contained are generally considered as of slight or negligible utility, and others, more detailed, differently combined or calculated, are wanted.

[Figures are accumulating at such a rate that nobody seems to have leisure to recognise the relations of sub-groups to the whole. It is as if individual workers were bringing their stones to one great building and piling them on and cementing them together, without regard to any general plan, or to their individual neighbour's work.]⁶ There is a mass of uncontrollable figures for the uncontrolled use of everybody; it is impossible to grasp more than fragments of these figures; and still there is a tendency to abstract from them and to generalise them.

Thus we see that statistics have already reached a state where the danger of chaos is impending. There is an immense number of statistical publications which will, if everything goes on as it does, certainly continue to increase. The general survey of the numerical facts contained in these publications is, however, very far from being satisfactory. Knowing, as all professional statisticians know, the divergence of methods in the collection and working up of the data, the manifold meaning of verbally identical terms, and the consequent impossibility of making comparisons either in time or in space, of rationally compiling⁷ and reducing the millions of figures into fewer expressions intelligible to our brain,—one might ask, whether the immense expenditure spent in labour and printing for all these publications is proportional to the scientific or practical gain arising from the publication of this mass of statistics?

I am quite ready to meet on this spot the counter argument, that it is characteristic also of other sciences,⁸ that at a certain

⁶ I am using here words of Professor Pearson slightly altered (*Grammar of Science*, 2nd edition, p. 13), naturally in another sense and for another purpose than he does.

⁷ Publications like the *XIth Annual Report of the Commissioner of Labour*, Washington, 1900, are rather misleading. The professional statistician, of course, knows that he might not dare to compare the wages of various countries, signifying utterly different sorts of remuneration, collected and calculated on the most divergent basis, and trustworthy in a very different degree, &c., but the great public finding about 900,000 entries united in two volumes, even converted into American money, naturally jumps at comparing them and drawing conclusions therefrom.

⁸ As shown for instance by the history of geology in England in the first half of the nineteenth century. The example of geology is not quite applicable to our case, because geologists even then tried to collect the data by uniform methods by identical questionnaires, &c.

stage the collecting of data forms the chief aim, whilst the synthetic work remains the duty of later generations.

Not that the collecting of data is questionable: the correct statement of any numeric facts surely enriches our knowledge, if only the methods are known through which the statement has been arrived at.

What is questionable is, whether it is necessary to publish all or so much statistics in print as is done nowadays? whether a certain self-restraint in printing statistics, and a systematic organisation of what ought to be printed, would not secure an economy of labour, and money as well, and also possibly other advantages?

I do not want, of course, to preserve statistics for the mystic use of a privileged priesthood—the statisticians themselves—but if discouraging the printing of so much statistics will lead not only to essential improvements as regards our science, but also lessen the untrained, unscrupulous use of statistics, so much the better.

I willingly admit that it is merely *formal* to raise the question: *is the publishing of so much statistics necessary?* I am more than convinced that all those who work at the unification of methods, classifications, measurements, &c., do the very *essential* thing for promoting our science. But all efforts in this direction seem to have had only fractional results. And it is perhaps possible by organising in a better way the formal side of how to publish and what to publish of statistics, to advance also the essentials of our science.

It is not in my power to decide in detail what statistics or which parts of them should remain unpublished. I simply venture to draw the attention of those competent to deliberate and to decide upon it.

Still some suggestions may be offered as to how a restriction of publishing statistics in print could be usefully made, and how it would work.

Printing less means a saving of money, and especially of time and energy. Hence more efficient work could be done, and those parts of statistics which in future would appear in print could be ready at earlier dates.⁹ The statistics not to be printed ought to be typewritten. The modern technique of typewriting and copying makes it easy to reproduce a good number of copies quickly at a nominal cost. Such copies ought to be sent to other statistical offices, to libraries and such like public institutions, where the public, and especially those competent to read and understand statistics, could easily consult them.¹⁰ It is even possible that the

⁹ M. de Foville, in his excellent essay: “La statistique et l’opinion” (*Bull. Inst. int. de Stat.*, XIII, pp. 344 and 345), placed at the top of the infirmities of statistics: slowness!

¹⁰ v. Mayr, in a most interesting review on Lang: “Entwicklung der Bevölkerung in Württemberg,” *Allg. Stat. Arch.*, VI, 1904 (pp. 298 and 299), very strikingly says: “Je grösser die Bändereien der Veröffentlichungen der amtlichen Statistik werden, umso mehr macht sich da und dort die Befürchtung geltend, dass die praktische und wissenschaftliche Nutzbarmachung des mehr und mehr sich anhäufenden statistischen Stoffes nicht im richtigen Verhältnisse zu dem Anwachsen dieses Stoffes und den für Ausgestaltung desselben erforderlichen Mühen und Kosten stehe.” In arguing further he is naturally coming

typewriting, copying, and preserving of the original census cards might be carried out. The respective cards should be distributed amongst those units of the administration to which they would be a great service. The building up of a new system of administrative registering, with the aid of such a collection of cards, and their keeping up to date, is quite conceivable.

But the ideal conception of the future of statistics consists in what may be termed the realisation of a French saying I heard somewhere "le livre de l'avenir c'est l'office!" Why not use the money and energy saved by less printing, for the transformation of all statistical bureaux into "real offices," really "rendering aid" by answering questions, inquiries? Why should hundreds and thousands of busy people hunt in big volumes for statistical data, compile, calculate, &c., making mistakes and hardly ever finding what they really want, if their requests to know the figures for such and such topics could be easily and with authority answered by the clerks of the offices, or if they could be told that the figures looked for are not known, or the question raised is not answerable statistically? In supposing such a service it would be only reasonable if answering questions, or furnishing special parts of statistics, or doing some calculations, would be charged for at reasonable rates, whilst public bodies or institutions of a public character would be served free of charge.

This plan from the bureaucratic point of view may perhaps look *bizarre*, but it is of a really democratic conception. Throwing millions of figures to the public and letting them do as they like is not the right way; supply them with the real knowledge, give them trustworthy information, answer their questions, or if they are unanswerable, tell them so.

Some model of this plan might be found, if I am not mistaken, in the geological survey service in force in Belgium. No general geological maps are any longer issued there. All additions, changes, improvements coming to the notice of the Geological Survey Office are at once entered on the large manuscript maps. If anybody applies for a map of some region of interest to him, he receives a drawing of the map of this region, which naturally is quite correct up to date. A printed map is something finished, and until a new edition appears, all faults remain unchanged, all additions unnoticed. So it is with statistics. A printed table of statistics is only up-to-date at its appearance, or at the moment of tabulation. Statistical

to the conclusion: ". . . muss es daher grundsätzlich als verfehlte Sparsamkeit angesehen werden, wenn schliesslich, nachdem der Aufwand für Erhebung und Bearbeitung naturgemäss die Gliederung der Nachweise nach kleineren Gebietsabschnitten gebracht hat, im letzten verhältnismässig die geringsten Kosten verursachenden Stadium, nämlich bei der Veröffentlichung, das mühsam errungene Sonderwissen von den Zuständen und Erscheinungen in den kleineren Gebietsteilen lediglich der erstrebten Verminderung von Druckkosten geopfert wird." Still, there is no reason why such excellent special inquiries as that of Lang should not have been made, even if the whole of the Württemberg statistics would not have appeared in print, but been at the disposition of the author in a typewritten copy.

records kept at statistical offices may be constantly corrected and brought up to date. To make their consultation quick and easy, to answer from them questions, to hand over typewritten copies of any part of them, is surely only a problem of modern library, bureau, and record technique.

The advantages of such a new state of order would certainly be multiplied if more uniformity and centralisation of statistics in each country, and perhaps also more international understanding, could be reached. A time may come when a high areopagus—a federation of all chiefs of statistical bureaux, will decide what statistics have to be worked at, and which of them shall be published in print.

Meanwhile I venture to think also that, as regards international understanding and agreement, some formal steps may be usefully taken. With respect to this I am making a suggestion very far indeed from what is aimed at by the admirable work done by the International Statistical Institute; I am aiming at the establishing of an international code of technical terms used in statistics. I do not think that such a code should necessarily impose the general use of uniform categories in statistics. This would be the ideal condition, which however will probably never be reached, on account of its necessitating a course of action very revolutionary in its nature and entailing great difficulties. I simply want to show the necessity of precisely defining all the technical terms used in statistics, because, as everybody knows, the chief source of trouble is that the same terms are used for different or not entirely identical ideas. If any national or otherwise independent branch of statistics should adhere to some term used in another sense elsewhere, the use of I, II, III, &c., after the term might serve as a means of distinction. The best plan, however, would be to use the *decimal classification*¹¹ for marking all the terms used in statistics. Then the proposed code would become an international dictionary. All the terms used in statistics should be arranged in alphabetical order without regard to the different languages. Each term should be followed by its decimal number. Systematic tables of the decimal numbers, following naturally the order of the numbers, should be drawn up for each language. Thus the dictionary would indicate at a glance the corresponding decimal number, whilst the systematic table would give the full explanation of the term marked by this decimal number in the language of the searcher. If statistical tables in the future could be provided with the corresponding decimal numbers, in addition to the headings in the national language, a really international language,¹² intelligible to every statistician, would be arrived at.

These are the two suggestions, referring to the formal organisation of publishing statistics, for which I venture to ask the kind consideration of the Institute.

¹¹ This system of classification was invented by the American, M. Dewey, and developed by the Institut International de Bibliographie in Brussels. It is now in extensive use. See for particulars the publications of this Institute.

¹² M. de Foville, in his before-mentioned essay (pp. 346 and 349), names as the second infirmity of statistics; the diversity of languages.

IV.—*M. de Foville on Statistics.*

By Sir J. ATHELSTANE BAINES, C.S.I.

SEVERAL of our colleagues in France, Germany and Holland have sent to scientific publications in their respective countries accounts of the last Congress, dealing, mainly, with its proceedings and resolutions. M. de Foville, however, has taken a higher flight, and, with the Congress as his *point d'appui*, has entered upon more general considerations in the two papers he has recently published in Paris: The "Profession de foi d'un Statisticien," read before the annual meeting of the Five Academies, and the article in the *Revue Politique et Parlementaire*, on Statistics, Statisticians and their International Institute, are both based upon a text furnished by the comment of the *Times* upon the Congress, to the effect that whilst the layman is always ready to draw definite conclusions from statistics of any sort, the expert, in discussion with his kind, seems inclined to question the adequacy of their inquiries, the efficiency of their methods, and the trustworthiness of their interpretations. No doubt, adds the writer, the experts have more solid ground for their scepticism than the layman has for his credulity. One epigram breeds another, and M. de Foville is not the man to let slip his chance. Surely, says he, statisticians could not show better than by their questionings the reverence in which they hold the austere Muse to whose service they are dedicated! There are always lots of people engaged in putting into circulation false statistics, as there are others passing false coin, and the man in the street, knowing that he is himself incompetent to distinguish the genuine from the counterfeit, leaves it to the statistician to act as his assayer. The latter, argues our author, is bound to be at one and the same time a true believer and a sceptic. He must believe in the art—not to call it a science—of numerical synthesis and analysis which he professes; not to do so would almost amount to having his doubts about arithmetic. He must believe in its mission of enlightenment, statistics being to the barque of administration the modest but necessary searchlight which discloses the whereabouts of latent rocks, shoals, or prowling enemies. Here the author cites apposite instances in justification of the faith that is in him. At the same time he admits that that faith is by no means absolute, and, whilst emphatically repudiating the insinuation that statisticians, like augurs, meet each other with their tongue in their cheek, he allows that their conviction falls just a little short of complete self-satisfaction. They feel, he thinks, some irritation at the fact that in some quarters their conclusions are invariably called in question, whilst in others they are never called in question at all. The illustration of this susceptibility given by the author is too choice an exotic to be endangered by translation:—

"Plus d'un statisticien, à l'égard de la statistique, ressemble à ce mari chagrin qui sait bien que sa femme ne le trompe pas et qui ne la laisserait pas

accuser de légèreté ; mais qui n'est pas content non plus si ses amis semblent admettre qu'elle n'a jamais pu avoir à se défendre contre la moindre tentation."

Statistics, in fact, are, from one point of view, too easy of access, from another too difficult, to satisfy the true statistician. On the one hand, there is no test or guarantee of competency required of those who would enter into their domain beyond a nodding acquaintance with the four rules of arithmetic. I came across a verse years ago which, quoting from memory, ran somewhat as follows :—

“ Pour le peu d'esprit que le bonhomme possédait,
L'esprit des autres par complément il prenait ;
Il compilait, compilait, compilait ! ”

—and no doubt passed in some quarters for an accomplished statistician. But such a use of figures as the above is innocent compared with the way in which they are dragged into the service of the daily Press, which, according to M. de Foville, seethes from morn to eve with statistics, so called, traceable only to the vivid imagination of the purveyor of “*occ. pars.*” Still greater offenders are those who fish in the troubled waters of the stock market, ground-baiting with *Péloquence des chiffres* : the more florid the less it is hampered with any links with fact. On the other hand—and here is M. de Foville's main point—the statistician desirous of apprenticing his art solely and entirely to the service of truth and probity, finds himself face to face with almost innumerable difficulties. It is scarcely exaggerating the position to say that the wider and more profound his experience, the more, he finds, must be eliminated or qualified amongst the material subjected to his scrutiny before he draws his conclusions from it. He must not only have complete mastery of his methods and thorough acquaintance with the ground he is traversing, but must be possessed also of a specially developed critical sense—of scepticism, in fact—in order to enable him to deal with what lies below the surface. Of the strange results of a deficient endowment with this sense our author gives, as may be supposed, interesting and amusing instances. Statisticians, he concludes, are sceptics, because they are aware of these pitfalls in their path. They are, also, believers, by reason of their conviction of the exalted objects of their calling, of the magnitude of what it has already achieved, and of the still greater future that lies before it, and, with equal sincerity, of the science and probity of those who have led and are leading them towards their goal.

V.—*Completed Cases of Incapacity from Injury during the Year ending 30th June, 1904, deduced from the Annual Returns of Certified Schemes under the Workmen's Compensation Acts, 1897 and 1900.*
By WILLIAM H. TOZER.

IN the paper I read before the Society in April of last year upon the subject of Workmen's Compensation, in which reference was more especially made to certified schemes under Section 3 of the Act of 1897, particulars were given of the duration of cases of incapacity arising from injury, and the average payment per week during that incapacity, based upon the experience of the five years covered by the paper. The cases dealt with included not only those which were completed, but those which at the end of the period remained uncompleted, no means being available to enable the experience of the former class only to be given. In the Annual Returns furnished to the Registrars of Friendly Societies for England and Scotland—no schemes having been certified in Ireland—for the year ending 30th June, 1904, information is given of the number of cases of incapacity completed during the year ending that date, their duration, and cost; whether the cases began and ended during the year, or were brought forward from the previous year and completed during the year covered by the Return.¹

In the aggregate, 17,835 cases of incapacity from injury were completed, the total duration of incapacity amounted to 76,389 weeks, in respect of which 50,506*l.* compensation was paid. In 8,852 cases, or nearly 50 per cent. of the total number, the duration of incapacity was two weeks and under, the cost being 7,907*l.*, or an average of 17*s.* 10*d.* for each case. In 256 cases (1·5 per cent. of the whole) the incapacity exceeded twenty-six weeks, the average duration being 65·8 weeks, and the cost to the funds 44*l.* for each case, or 13*s.* 5*d.* per week of incapacity. Payments of gross sums amounting to 6,530*l.* were also made during the year in respect of injuries of a permanent nature, or in termination of existing cases of injury.

In the following tables details are given of the number of cases, and the duration and cost of incapacity from injury under the various groups of occupations. As shown in Table 2, the proportion per cent. of cases of incapacity to persons employed is lowest (7 per cent.) in English factories, and highest (25 per cent.) in quarries. On the other hand, the average duration of incapacity is lowest (two weeks three days) in quarries, and highest in mines. The proportion of cases not exceeding two weeks' duration to the whole number of cases is lowest (41 per cent.) in English factories, and highest (65 per cent.) in quarries; while the average weekly

¹ *Report of the Chief Registrar of Friendly Societies for 1904, Part A.*
[Parliamentary Paper No. 41. Session 1905.]

allowance per case is lowest in quarries (9s. 6d. per week), and highest in railways (19s. 3d.).

TABLE 1.

In the following table the experience of incapacity from injury is shown under the various groups of occupations:—

Period of Incapacity.	GROUP I. Railways. (Number of Members, 40,940.)			GROUP II. Factories, &c.					
				England and Wales. (Number of Members, 18,471.)			Scotland. (Number of Members, 2,971.)		
	Number of Cases.	Duration.	Amount Paid.	Number of Cases.	Duration.	Amount Paid.	Number of Cases.	Duration.	Amount Paid.
		w. d.	£		w. d.	£		w. d.	£
2 weeks and under .	1,871	2,533 4	2,324·042	545	726 1	447·393	164	214 1	88·041
Over 2 weeks and not over 4	1,294	3,762 0	3,518·133	442	1,091 5	707·253	96	267 5	156·571
Over 4 weeks and not over 6	432	2,134 2	2,017·392	163	820 5	590·683	38	187 1	117·399
Over 6 weeks and not over 8	185	1,307 1	1,240·009	73	512 2	378·550	16	108 2	59·921
Over 8 weeks and not over 10	103	921 0	873·454	40	356 1	231·588	4	38 5	24·671
Over 10 weeks and not over 13	75	868 2	818·670	29	327 5	203·651	4	49 1	19·842
Over 13 weeks and not over 26	131	2,341 2	2,242·425	25	459 0	343·166	6	106 5	72·167
Over 26 weeks	70	3,377 2	3,532·250	9	467 3	327·509	5	158 5	64·267
Total	4,161	17,245 1	16,566·375	1,326	4,761 4	3,229·793	333	1,131 1	602·879

Period of Incapacity.	GROUP III. Mines, &c. (Number of Members, 54,000.)			GROUP IV. Quarries. (Number of Members, 1,237.)			Total. (Number of Members, 117,619.)		
	Number of Cases.	Duration.	Amount Paid.	Number of Cases.	Duration.	Amount Paid.	Number of Cases.	Duration.	Amount Paid.
		w. d.	£		w. d.	£		w. d.	£
2 weeks and under...	6,066	8,984 4	4,932·937	206	247 4	115·550	8,852	12,706 2	7,907·963
Over 2 weeks and not over 4	3,034	9,602 5	5,230·855	66	187 0	89·967	4,932	14,911 3	9,702·779
Over 4 weeks and not over 6	1,107	5,763 5	3,152·167	24	124 2	59·875	1,761	9,030 3	5,937·516
Over 6 weeks and not over 8	558	4,025 4	2,275·654	9	65 2	30·200	841	6,018 5	3,984·334
Over 8 weeks and not over 10	282	2,787 3	1,808·492	5	46 4	21·383	434	4,150 1	2,959·588
Over 10 weeks and not over 13	189	2,292 5	1,322·534	2	22 2	11·167	299	3,560 3	2,375·864
Over 13 weeks and not over 26	293	6,233 0	3,659·532	2	33 1	14·900	457	9,173 2	6,332·190
Over 26 weeks	171	12,794 1	7,361·859	1	40 5	20·416	256	16,838 4	11,306·301
Total	11,700	52,484 3	20,744·030	315	767 2	363·458	17,835	76,389 5	50,506·535

TABLE 2.—*Incapacity from Injury.*

Number of Cases per 100 Workmen.		Percentage of Cases not Exceeding Two Weeks' Duration to the Total Number of Cases.	
Factories (English)	7.2	Factories (English)	41
Railways	10.2	Railways	45
Factories (Scottish)	11.2	Factories (Scottish)	49
Mines	21.7	Mines	52
Quarries	25.5	Quarries	65
Average for the above } occupations		Average for the above } occupations	
	15.2		50
Average Duration of Incapacity.		Average Weekly Allowance.	
	Weeks. Days.		s. d.
Quarries	2 3	Quarries	9 6
Factories (Scottish)	3 2	Factories (Scottish)	10 8
„ (English)	3 4	Mines	11 4
Railways	4 1	Factories (English)	13 7
Mines	4 3	Railways	19 3
Average for the above } occupations		Average for the above } occupations	
	4 2		13 3

VI.—*Woodland Area of Great Britain, 1905.*¹

IN connection with the Agricultural Returns of the year 1905, special inquiries were made with the view of ascertaining the extent of land now occupied by woods in Great Britain, in pursuance of a recommendation by the recent Departmental Committee on British Forestry that a return should be obtained by the Board in continuation of that of 1895. The difficulties of securing an exhaustive return of all land under wood have been pointed out in commenting on the previous returns of this nature, but it is believed that the special pains taken by the officers of Inland Revenue in the distribution and collection of the schedules have resulted in rendering the present return substantially accurate. It is to be observed, however, that in some instances the inclusion of woodland areas, which were formerly overlooked, may tend to vitiate comparisons with previous figures for particular counties or districts, and may account to some extent for apparent increases in the areas returned.

¹ From the *Acreege and Live Stock Returns*, 1905, of the Board of Agriculture and Fisheries.

The woodland area is now returned under the several categories of (1) Coppice, *i.e.*, woods, whether containing standards or not, that are entirely cut over periodically and reproduce themselves naturally by stool shoots; (2) Plantations, *i.e.*, land planted or re-planted within the last ten years; and (3) "Other Woods," which include all land (not returned as coppice or plantation) used altogether or mainly for the growth of wood (other than orchards). The data for each county in 1905 are thus classified, and the total figures are compared with those returned in 1895.

Summarising the new returns geographically in the groups of counties usually adopted for the purposes of the Agricultural Returns, the woodland acreage of 1905 was distributed as follows:—

Divisions.	Coppice.	Plantations (since 1895).	Other Woods.	Total Woodlands.
	Acres.	Acres.	Acres.	Acres.
I. Eastern and north-eastern } II. South-eastern and east } midland }	47,159	11,297	189,038	247,494
III. West midland and south- western }	270,683	15,580	318,303	604,566
IV. Northern and north-western	184,618	16,156	268,815	469,589
	35,663	16,614	341,547	393,824
England	538,123	59,647	1,117,703	1,715,473
V. Wales	15,733	8,629	159,999	184,361
VI. Scotland (eastern)	8,645	22,768	421,489	452,902
VII. " (western)	14,370	12,639	388,498	415,507
Great Britain	576,871	103,683	2,087,689	2,768,243

The present total area thus shown in Great Britain, 2,768,243 acres, is 42,127 acres in excess of that returned ten years ago. This extension was, however, confined to England and Wales, the total area of woods in Scotland showing a decline of 10,356 acres. The decrease north of the Tweed has occurred notwithstanding the fact that 35,407 acres of land are returned as having been planted or re-planted during the last ten years, so that it would appear that the clearance of woodland areas by storms and from other causes has been considerably greater than the owners of land have been able to make good.

Some indication of the extent of planting or re-planting which has apparently taken place within the past twenty-four years may perhaps be given by comparing the returns of plantations collected for 1891, 1895, and 1905 respectively. The areas planted or re-planted in the three periods appear as under for the agricultural divisions above referred to:—

Divisions	1881 to 1891.	1891 to 1895.	1895 to 1905.
	Acres.	Acres.	Acres.
I. Eastern and north-eastern	5,879	3,145	11,297
II. South-eastern and east midland	12,481	4,176	15,580
III. West midland and south-western	14,270	4,484	16,156
IV. Northern and north-western ...	14,643	4,159	16,614
England	47,273	15,961	59,647
V. Wales	11,120	2,533	8,629
VI. Scotland (eastern)	19,957	8,335	22,768
VII. „ (western)	20,590	6,074	12,639
Great Britain.....	98,940	32,903	103,683

It will be noted that whereas the earlier and later periods extended over ten years, the intermediate period embraced only four years. By dividing the figures in each case by the numbers of years represented, the apparent average annual rate of planting thus obtained may be considered to indicate approximately the relative amount of activity in woodland extension during each period. Subject to the caution already given as to the possibility of more complete returns, it would appear that planting was carried on in Great Britain, as a whole, during the past decade at the rate of 10,368 acres per annum, as compared with 8,225 acres during 1891-95 and 9,894 acres during 1881-91.

This tendency to reduced activity in the middle period, followed by greater activity after 1895, is suggested both in England (as a whole) and in Wales. In the Eastern counties, as well as in the group of counties lying on the Welsh Border, there is a suggestion of continuously progressive activity during the whole twenty-four years, but in all other parts of the country the general indication is in the direction just mentioned. In Scotland experience seems to have been more varied. In the Eastern and Lowland division the rate of planting has, on the whole, increased, whereas in the Western and Highland division it seems to have substantially diminished. This seems to be largely due to some exceptional activity in Inverness and Ross and Cromarty during the decade 1881-91.

VII.—*Agricultural Returns of Great Britain, 1905. (1. Acreage and Live Stock. 2. Produce of Crops.)*

THE Agricultural Returns of Great Britain for 1905 show that the total arable land now amounts to 15,086,338 acres, as compared with 15,219,554 acres in 1904; while pasture land shows an increase, there being 17,200,494 acres returned, as against 17,098,056 acres in the preceding year, the net result being a decline of 30,778 acres in

AGRICULTURAL RETURNS of the United Kingdom for 1905. Acreage under Crops and Grass; and 4th June, 1904, in each Division of Great Britain; with

	England.		Wales.		Scotland.	
	1905.	1904.	1905.	1904.	1905.	1904.
	Aeres.	Aeres.	Aeres.	Aeres.	Aeres.	Aeres.
Total area of land and water ^b	32,551,802	32,551,802	4,777,133	4,777,133	19,458,728	19,458,728
Total acreage under crops and grass ^c	24,611,186	24,630,092	2,794,661	2,798,880	4,880,985	4,888,638
Corn Crops—						
Wheat	1,704,281	1,302,404	41,073	35,144	48,641	37,736
Barley or bere	1,410,287	1,543,579	91,243	96,341	212,131	200,764
Oats	1,880,475	2,059,083	207,929	212,240	962,972	980,739
Rye	55,451	49,438	1,145	1,228	5,598	5,028
Beans	243,242	240,645	1,177	1,235	10,346	10,902
Peas	173,384	173,793	911	917	910	898
Total	5,467,123	5,369,862	346,508	347,105	1,240,601	1,236,067
Green Crops—						
Potatoes	434,773	402,760	29,435	29,714	144,265	137,735
Turnips and swedes	1,083,640	1,091,344	60,327	61,039	445,306	451,721
Mangold	391,712	385,616	10,022	10,212	2,389	2,969
Cabbage, kohlrabi, and rape	159,914	159,085	4,587	4,189	14,725	14,709
Vetches or tares	126,934	118,480	938	877	8,557	8,872
Other crops	155,557	152,700	1,262	1,390	2,699	2,581
Total	2,352,530	2,310,018	106,571	107,421	617,941	618,587
Clover, sainfoin, and grasses under rotation—						
For hay	1,569,430	1,698,490	192,170	203,039	427,686	421,866
Not for hay	1,004,535	1,019,778	153,106	159,431	1,130,591	1,169,391
Total	2,573,965	2,718,268	345,276	362,470	1,558,277	1,590,757
Permanent pasture or grass not broken up in rotation—^c						
For hay	1,033,908	4,116,855	506,270	502,756	148,342	145,792
Not for hay	9,726,684	9,576,560	1,482,906	1,471,711	1,302,384	1,284,382
Total	13,760,592	13,693,415	1,989,176	1,974,467	1,450,726	1,430,174
Flax.	437	551	—	3	4	9
Hops	48,967	47,799	—	—	—	—
Small fruit.	71,119	70,612	1,213	1,263	6,493	6,072
Bare fallow	336,453	419,567	5,917	6,151	6,943	6,972
Horses used for agricultural purposes^d	No. 871,082	No. 869,618	No. 91,817	No. 91,552	No. 156,520	No. 156,277
Unbroken horses—						
1 year and above	230,994	224,969	43,755	42,446	35,564	33,956
Under 1 year	102,048	101,355	23,331	23,464	14,302	13,799
Total of horses	1,204,124	1,195,942	161,923	160,262	206,386	204,032
Cows and heifers in milk or in calf	1,990,402	1,961,860	279,852	277,462	437,138	439,358
Other cattle—						
2 years and above	1,048,518	1,034,419	90,469	83,931	276,330	256,286
1 year and under 2	1,007,196	968,464	178,534	176,849	285,040	284,530
Under 1 year	974,520	952,489	189,934	190,193	228,787	232,521
Total of cattle	5,020,936	4,917,232	738,789	728,435	1,227,295	1,212,685
Ewes kept for breeding	5,582,054	5,570,760	1,435,168	1,415,284	2,918,544	2,894,864
Other sheep—						
1 year and above	2,951,485	3,070,994	812,832	828,190	1,383,200	1,414,418
Under 1 year	6,161,479	6,167,208	1,286,967	1,246,211	2,722,467	2,659,249
Total of sheep	14,698,018	14,748,962	3,534,967	3,489,685	7,024,211	6,968,531
Sows kept for breeding	285,372	327,904	53,439	36,621	16,197	17,531
Other pigs	1,797,554	2,148,151	178,040	204,483	114,017	126,654
Total of pigs	2,083,226	2,476,355	211,479	241,104	130,214	144,185

^a Furnished by the Department of Agriculture and Technical Instruction for Ireland.

^b Not including foreshore and tidal water.

ed Number of Horses, Cattle, Sheep, and Pigs; as returned upon the 5th June, 1905, Particulars for Ireland, and Total for the United Kingdom.

Great Britain.		Ireland. ^a		United Kingdom, including Isle of Man and Channel Islands.		
1905.	1904.	1905.	1904.	1905.	1904.	
Aeres.	Aeres.	Aeres.	Aeres.	Aeres.	Aeres.	
787,663	56,787,663	20,710,589	20,710,589	77,684,006	77,684,006	Total area of land and water ^b
286,832	32,317,610	15,262,919	15,230,124	47,673,115	47,673,997	Total acreage under crops and grass ^c
796,995	1,375,284	37,860	30,825	1,836,598	1,407,618	Corn Crops—
713,664	1,810,684	154,645	158,103	1,872,305	2,002,854	Wheat
551,376	3,252,962	1,066,806	1,078,772	4,137,406	4,351,183	Barley or bere
62,197	55,714	10,155	8,414	72,480	65,177	Oats
254,765	252,782	1,471	1,890	256,383	254,892	Rye
175,235	175,608	253	185	175,624	175,934	Beans
						Peas
654,232	6,953,034	1,271,190	1,279,189	8,350,796	8,257,658	Total
608,473	570,209	616,755	618,510	1,236,768	1,200,419	Green Crops—
589,273	1,604,104	282,105	285,831	1,879,384	1,898,010	Potatoes
404,123	398,847	72,570	75,746	477,540	475,313	Turnips and swedes
179,226	177,886	45,695	43,146	225,315	221,478	Mangold
136,429	128,229	2,566	2,761	139,283	131,273	Cabbage, kohlrabi, and rape
159,518	156,671	24,682	24,459	186,082	182,901	Vetches or tares
						Other crops
1,077,042	3,036,026	1,044,373	1,050,483	4,144,374	4,109,394	Total
189,286	2,322,895	628,635	631,748	2,831,305	2,968,462	Clover, sainfoin, and grasses under rotation—
288,232	2,348,600	626,478	647,416	2,948,018	3,028,616	For hay
						Not for hay
477,518	4,674,495	1,255,113	1,279,164	5,779,323	5,997,078	Total
688,520	4,765,403	1,665,871	1,628,412	6,361,439	6,400,510	Permanent pasture or grass not broken up
511,974	12,332,653	9,971,518	9,939,223	22,503,934	22,292,795	in rotation— ^c
						For hay
						Not for hay
2,200,494	17,098,056	11,637,389	11,567,635	22,805,373	28,693,305	Total
441	563	46,158	41,293	46,589	44,856	Flax
48,967	47,799	—	—	48,967	47,799	Hops
78,825	77,947	4,531	4,512	88,941	82,980	Small fruit
329,313	432,690	4,195	4,848	353,742	437,927	Bare fallow
No.	No.	No.	No.	No.	No.	
122,419	1,120,247	373,182	368,954	1,502,939	1,496,443	Horses used for agricultural purposes ^d
310,333	301,371	94,567	93,132	406,317	395,922	Unbroken horses—
139,681	138,618	67,124	68,798	207,512	208,269	1 year and above
						Under 1 year
572,433	1,560,236	534,873	531,064	2,116,798	2,100,634	Total of horses
707,392	2,678,690	1,487,665	1,497,647	4,211,917	4,193,721	Cows and heifers in milk or in calf
415,317	1,374,636	1,041,313	1,026,609	2,461,820	2,405,923	Other cattle—
471,070	1,429,833	1,024,618	1,035,435	2,505,724	2,474,364	2 years and above
393,241	1,375,203	1,092,196	1,117,027	2,494,565	2,501,543	1 year and under 2
						Under 1 year
987,020	5,858,352	4,645,222	4,676,718	11,674,026	11,575,551	Total of cattle
935,766	9,880,908	1,506,349	1,524,933	11,471,872	11,436,017	Ewes kept for breeding
147,517	5,313,602	688,300	722,454	5,840,929	6,040,563	Other sheep—
173,913	10,012,668	1,554,664	1,580,532	11,763,937	11,628,529	1 year and above
						Under 1 year
257,196	25,207,178	3,749,313	3,827,919	29,076,738	29,105,109	Total of sheep
335,008	382,056	121,840	133,540	458,689	517,620	Sows kept for breeding
089,911	2,479,588	1,012,182	1,181,586	3,112,976	3,671,075	Other pigs
424,919	2,861,044	1,104,342	1,315,126	3,601,665	4,191,695	Total of pigs

^c Not including mountain and heath land.

^d Including mares kept for breeding.

the cultivated area of Great Britain. The feature of the year is the recovery in the area under wheat, owing to the unusually favourable seed time in the autumn of 1904, the increase over the preceding year amounting to no less than 421,711 acres, or 30·7 per cent., in Great Britain. Oats and barley, consequent no doubt upon the increased area under wheat, showed some decline, and the barley acreage is the lowest on record. Potatoes again occupy, for the first time since 1871, over 600,000 acres. Turnips and swedes have been falling off for several years; before 1887 the turnip crop occupied over 2,000,000 acres, and the shrinkage is most noticeable in England, where it amounts to 25 per cent. since that date. Mangolds, on the other hand, slightly increased, and again occupied over 400,000 acres. Clover and rotation grasses fell off by nearly 200,000 acres, the decrease being mainly in that portion of the crop reserved for hay; the permanent grass intended for mowing also shows a decline.

The special inquiry conducted this year into the area under woodlands in Great Britain is referred to on p. 737.

As regards live stock, both agricultural horses and cattle show the largest number on record; among the latter the group of cows and heifers in calf being also the highest hitherto returned. Sheep, for the first time since 1899, are also slightly augmented; while pigs, always a very variable total, show a large decline.

From the table given on pp. 743 and 744, giving the estimated total of the various crops, it will be seen that seven of the eleven items separately recorded were above the average—wheat, beans, mangolds, and hops by a considerable amount; while in none of the other four crops was the deficiency a large one. The harvest of 1905 may thus be described as distinctly satisfactory upon the whole; and this was more particularly the case in Scotland, where the hay crop alone was slightly below the mean. Wheat was nearly $2\frac{1}{4}$ bushels above the mean, and the total production almost 60 per cent. greater than the poor total of 1904. It is interesting to compare this result with the table on p. 286 in Dr. Shaw's paper in the last *June Journal*, where a very dry autumn gave promise of an excellent harvest; a promise which has been borne out, although the wheat yield, unlike the autumn of 1904, was not a record for the period. Barley was also a good crop, but oats were a little below the average, as were peas; beans, on the other hand, were one of the best crops of the year. All roots have yielded well, but hay was not abundant. Hops gave by far the highest yield per acre on record, though the total amount was surpassed in 1886, when, however, there were more acres under the crop than in 1905.

PRODUCE OF CROPS. *Preliminary Statement showing the Estimated Total Produce and Yield per Acre of the Principal Crops in Great Britain in the Year 1905, with Comparisons for 1904, and the Average Yield per Acre of the Ten Years 1895-1904.*

WHEAT.

	Estimated Total Produce.		Acreage.		Average Estimated Yield per Acre.		Average of the Ten Years 1895-1904.
	1905.	1904.	1905.	1904.	1905.	1904.	
	Bushels.	Bushels.	Acres.	Acres.	Bushels.	Bushels.	Bushels.
England	55,669,890	34,535,897	1,704,281	1,302,404	32·66	26·52	30·53
Wales	1,167,228	890,800	43,891	35,062	26·59	25·41	25·02
Scotland	2,065,381	1,453,549	48,638	37,722	42·46	38·53	37·72
Great Britain.	58,902,499	36,880,246	1,796,810	1,375,188	32·78	26·82	30·56

BARLEY.

England	47,288,182	47,028,421	1,410,287	1,543,579	33·53	30·47	32·58
Wales	2,817,436	2,983,409	91,243	96,341	30·88	30·97	30·23
Scotland	8,004,446	7,181,237	212,134	200,764	37·73	35·77	35·79
Great Britain.	58,110,064	57,193,067	1,713,664	1,840,684	33·91	31·07	32·82

OATS.

England	74,116,954	84,078,623	1,880,475	2,059,961	39·41	40·82	40·71
Wales	7,042,126	7,426,363	207,929	212,240	33·87	34·99	33·16
Scotland	35,277,807	35,902,862	962,972	980,739	36·63	36·61	36·43
Great Britain.	116,436,887	127,407,848	3,051,376	3,252,940	38·16	39·17	38·81

BEANS.

England	7,806,620	5,434,859	243,002	240,339	32·13	22·61	27·39
Wales	33,292	29,851	1,170	1,230	25·89	24·27	24·69
Scotland	364,818	363,079	9,923	10,515	36·76	34·53	33·08
Great Britain.	8,201,730	5,827,789	254,095	252,084	32·28	23·12	27·66

PEAS.

England	4,403,110	4,406,000	171,110	170,997	25·73	25·77	26·36
Wales	19,265	19,728	938	913	20·54	21·61	20·05
Scotland	17,108	15,375	630	575	27·16	26·74	25·54
Great Britain.	4,439,483	4,441,103	172,678	172,485	25·71	25·75	26·30

POTATOES.

	Tons	Tons.	Acres.	Acres.	Tons.	Tons.	Tons
England	2,619,276	2,462,613	434,773	402,760	6·02	6·11	5·84
Wales	163,889	143,964	29,435	29,714	5·57	4·84	5·36
Scotland	979,541	981,677	144,265	137,735	6·79	7·13	5·90
Great Britain.	3,762,706	3,588,254	608,473	570,209	6·18	6·29	5·83

PRODUCE OF CROPS. *Preliminary Statement for Great Britain for 1905—Contd.*

TURNIPS AND SWEDES.

	Estimated Total Produce.		Acreage.		Average Estimated Yield per Acre.		Average of the Ten Years 1895-1904.
	1905.	1904.	1905.	1904.	1905.	1904.	
	Tons.	Tons.	Acres.	Acres.	Tons.	Tons.	
England	13,906,669	14,240,944	1,083,640	1,091,344	12·83	13·05	11·91
Wales	771,119	1,000,805	60,327	61,039	12·78	16·40	14·81
Scotland	7,162,794	7,794,380	445,313	451,721	16·08	17·25	15·11
Great Britain.	21,840,582	23,036,129	1,589,280	1,604,104	13·74	14·36	12·88

MANGOLD.

England	8,002,318	7,252,440	391,712	385,646	20·43	18·81	18·39
Wales	165,833	180,615	10,022	10,212	16·55	17·69	16·17
Scotland	45,109	48,347	2,382	2,969	18·94	16·28	17·23
Great Britain.	8,213,260	7,481,402	404,116	398,827	20·32	18·76	18·32

HAY FROM CLOVER, SAINFOIN, &C.

England	2,243,712	2,542,597	1,569,430	1,698,490	Cwts. 28·59	Cwts. 29·94	Cwts. 28·79
Wales	232,655	252,612	192,170	203,039	24·21	24·88	23·78
Scotland	666,985	701,854	427,686	421,366	31·19	33·31	31·70
Great Britain.	3,143,352	3,497,063	2,189,286	2,322,895	28·72	30·11	28·89

HAY FROM PERMANENT GRASS.

England	4,395,414	5,140,332	4,033,908	4,116,855	21·79	24·97	23·61
Wales	482,649	511,218	506,270	502,756	19·07	20·34	18·39
Scotland	209,908	224,116	147,534	144,939	28·46	30·93	28·86
Great Britain.	5,087,971	5,875,696	4,687,712	4,764,550	21·71	24·66	23·23

HOPS.

England	Cwts. 635,943	Cwts. 282,330	48,967	47,799	14·21	5·91	8·64
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VIII.—*Notes on Economic and Statistical Works.*

Essays and Addresses on Economic Questions (1865-93), with Introductory Notes (1905). By the Right Honourable Viscount Goschen. xii + 354 pp., 8vo. London: Edward Arnold, 1905.

During a long and honourable public career, Lord Goschen has occupied with success various important positions, including high offices of State. He has been conversant with the actual administration of great affairs. He has taken a place in the forefront of polemical politics, and in an atmosphere of bracing controversy he has developed a native capacity for lucid exposition and direct forcible reasoning. He knows how to present complicated facts so as to attract and retain the interest of his hearers or readers, even if he has not enlisted on his own side of every debated question the convictions of those for whom the essays and addresses contained in this volume were originally prepared. A larger public will now welcome their reproduction in their present form. The instinct of the genuine orator for telling phrase and persuasive argument may be easily discovered, by those who seek, on most pages of the book, and for this reason it may be expected to appeal to others besides professional economists and statisticians.

The two articles, for example, with which the volume opens, on Seven Per Cent. and Two Per Cent., deal primarily with the circumstances of the Money Market, but Lord Goschen's graphic pen contrives to invest a detailed description of the contrasted situation of affairs in that particular contracted region during the neighbouring years of 1865 and 1868 with a wider and more abiding interest than the titles, terse and appropriate as they are of the articles, might perhaps themselves suggest. We have no doubt that the external layman as well as the business expert may address himself to the perusal of these papers in the sure hope that he will not be wearied or perplexed by Lord Goschen's treatment of the technicalities introduced into the discussion; and he will certainly be interested, and perhaps surprised, to find how wide and diversified may be the influence of forces originating and mainly operating within the Money Market. Nor does it, in this case at least, seem to need the introductory note prefixed to illustrate the permanent relevance of the conclusions drawn by Lord Goschen.

Yet these introductory notes in many instances add to the force of the original argument, and in nearly all afford the means of gaining instructive insight into the workings of the author's mind. They undoubtedly contribute to enhance the importance and attractiveness of the volume. The reflection, for instance, made by Lord Goschen in the introductory note to the address on the Conditions and Prospects of Trade, delivered before the Manchester Chamber of Commerce in 1885, to the effect that he was then a "missionary of Empire," can hardly be seen by the ardent fiscal reformer to-day without a haunting feeling that it must have been a very cruel stroke of unkind fortune which prevented the author of

this remark from giving a less unfriendly reception than he has actually accorded to recent proposals for fostering that colonial trade which twenty years ago he emphasised as being particularly important. There is also not a little material for suggestion, both for fiscal and for other reformers, in the acute discriminating observations prefixed to the address on *Laissez-faire* and Government Interference delivered to the Philosophical Society of Edinburgh in 1883. The subsequent drift of affairs is examined in these observations with such fulness and candour that they serve the purpose of an autobiography.

These introductory notes, like the essays and addresses themselves, remind us that, while Lord Goschen, as a keen politician and an able administrator, has throughout his busy life kept himself in constant contact with men and affairs, and has consequently been compelled to deal with hard facts rather than to handle abstruse theories, and in his Preface expressly disclaims the title of a "trained and scientific economist," yet he has always felt and evinced an interest both in economic thought and in statistical inquiry. Two of the papers contained in the present volume were in fact delivered from the presidential chairs of the Royal Statistical Society, and of what was then the British Economic Association. By the general admission of the members of those bodies, Lord Goschen was recognised as a fitting occupant of the respective chairs, and no one who now peruses the addresses reprinted in this volume will doubt the validity or justice of that verdict. The address to the Royal Statistical Society in 1887, on the Increase of Moderate Incomes, is certainly not the least important of the contents of the book; and the Fellows of the Society who heard the address when it was delivered, will read with especial interest the supplemental study which is now added. They will realise the seriousness of the obstacles which Lord Goschen has encountered in comparing the evidence of later statistics with those used effectively in 1887. They will appreciate the significance of the fact noted by him, that a superficial view of the subsequent figures might even seem to fail to confirm the earlier conclusions. They will share his regret that changes introduced into the system of compiling or presenting the numerical data hinder exact comparison and render interpretation hazardous. But Lord Goschen's handling of the crucial difficulties of this problem furnishes fresh proof of his capacity as an expert statistician; and similarly, when we read his disclaimer of the title of trained economist, we cannot forget that his early book on the Foreign Exchanges has passed through many editions, and reached the rank of an economic classic.

It is true that his interests in economic study have mainly been in departments which are most allied to business practice—such as currency, banking and finance—and the essay on the depreciation of silver, and the address on the cash-reserves, reprinted in the present volume, are convincing examples of his complete mastery of these portions of economic theory. He himself, we may note, tells us in his Preface that the "mental processes" through which he was put at that University of Oxford where he took high honours as an

undergraduate, and is now the occupant of the most exalted position of Chancellor, enabled him to "construe" commercial documents and to subject to "logical scrutiny" bills of exchange. In a very real sense, like Bagehot himself, he may be said to present in his person that union of the characters of practical man of business and of economic theorist, which in Bagehot's epigrammatic language is the cherished desideratum but the rare acquisition of Economists. In his public life, as these essays and addresses clearly demonstrate, Lord Goschen has not failed to bring his economic knowledge to bear, where opportunity has offered, on the management of great affairs. He has certainly been no mere academic theorist, possessed by abstruse reasoning, and separated from actual fact; but he has none the less endeavoured with success to avoid the characteristic error of the practical man, who prides himself on his neglect of systematic thought, and is content with the superficial immediate aspects of a question. L.L.P.

The Law of Error. By Professor F. Y. Edgeworth. From the *Cambridge Philosophical Transactions*, vol. xx, part 1, 1905. 59 + xiv pp.

It is steadily becoming more and more apparent that the treatment of statistical problems, whether they arise in economics, sociology, or biology, necessitates constant appeals to the laws of chance, and that, paradoxically, unless the material allows such an appeal, we cannot obtain in our results reasonable probability, not to speak of certainty.

Two schools of thought are prominent in the development of the theories and practice with the help of which and by which the application of mathematical probability to statistical problems are made. In the one, the predominant idea is to find a purely empirical formula to fit the observations, the excellence of the formula being measured by the closeness of the fit and the fewness of the arbitrary constants, and then to assume that the observations can be replaced by the mathematical formula, and the laws of chance applied; in the other it is rather sought to find *a priori* what mathematical law will tend to be obeyed if certain postulates are given as to the genesis of the observed quantities, and to discover those postulates which yield a law that adequately describes the phenomena. The methods and the formulæ of the two schools are intimately connected, and in many cases yield identical results. Professor Edgeworth is the most distinguished worker, not to say the protagonist, of the latter school.

Appeals to mathematical formulæ are so often made on vague and uncertain principles, that everyone will welcome the searching analysis of the fundamental postulates of the law of error which Professor Edgeworth has long been carrying on, and of which a very important result is before us. For long it was the custom to assume the suitability of the Gaussian law of error ($\log y + kx^2 = \text{const.}$) for the reduction of physical and statistical measurements, and the "method of least squares" is based on it; but this assumption

has not stood the tests of verification under the hands of Professor Karl Pearson, or of theoretical analysis by Professor Edgeworth, following Poisson. If a series of observations are taken of an entity whose magnitude depends on a great number of independent causes, none of which alone can produce more than a small effect, is it to be expected that members of the series will be grouped according to a definite law, and is that law one of symmetry with respect to the average of the observations? Analysis, based on various considerations, long ago suggested the Gaussian law; but experience is the ultimate test of hypotheses as to chance as well as to physical laws, and experience has given a somewhat doubtful answer. Further consideration of the postulates shows that perfect symmetry cannot in general be expected, and that an unsymmetrical term should be added to the simple exponential law. So far we can go by unassisted reasoning.

The paper before us takes us further. Describing the law of error as "the approximate expression of the frequency with which in the long run different values are assumed by a quantity which is dependent on a number of variable items or elements," the author proceeds to define provisionally eleven conditions which the elements must fulfil to support his analysis. Accepting these conditions, he seeks a general expression which shall form by its successive terms a series of approximations to the law.

The expression found may be written:—

$$y = [e^{-z/l_1 D^3 + z^2/l_2 D^4 - z^3/l_3 D^5 + \dots}] y_0,$$

where D denotes differentiation with regard to x , $\log y_0$ differs from $-x^2/c^2$ by a constant, and l_1, l_2, \dots are constants depending on successive moments of the observations about their average. When this expression is expanded the successive coefficients of z form the first, second \dots approximations to the law of error.

The first approximation is the Gaussian law. The second approximation introduces an unsymmetrical term. The second and third approximations are identical with those already given by the author.¹ Thus $6l = m_3$, and $24l_2 = m_4 - 3m_2^2$, when the quantities are expressed in terms of their standard deviation, and m_2, m_3, m_4 are the second, third, and fourth moments about the centre of gravity.

It is shown that under the conditions postulated the approximations are in descending order of magnitude. The nature of this descent has already been discussed for the second and third,² and it seems improbable that further terms will often be needed for practical purposes.

The proof first given of this formula is based on a new method, and is a triumph of analysis. The postulates are, first, the conditions to be fulfilled by the elements; secondly, that "the mean of the product of two independent statistical quantities—the pairs being

¹ *Journal of the Royal Statistical Society*, 1900, pp. 76 and 77.

² *Ibid.*

supposed to be repeated with indefinitely great frequency under unaltered conditions—is equal to the product of their respective means;” thirdly, that the approximation is satisfactory when the successive moments (the mean powers of deviation) are nearly equal, whether calculated from the phenomena or the mathematical law. The first postulate we shall return to; the second is regarded as self-evident; the third has been accepted in all recent investigations.

The same problem is attacked by three other methods, those connected respectively with the names of Professors Crofton and of Poisson and Laplace, and a blend of these methods. It is found that with similar postulates identical results are obtained.

We may take it then that, given certain conditions to be fulfilled by the elements, the law of error is correctly enunciated and may be used for statistical analysis. It remains to describe these conditions.

In a somewhat dramatic and characteristic way the author first lays down eleven stringent conditions to be satisfied, and obtains his proof. He then shows in Part II that three of these may be removed, three replaced, three relaxed considerably, and the remaining two relaxed slightly. After these relaxations the conditions are exceedingly elastic, and may doubtless be frequently realised in fact. As it is in many practical cases possible and necessary to build up the magnitude of a statistical entity out of known elements, and in others it is possible to know the nature of the elements, it is of the first importance to understand the conditions when all unnecessary restrictions are removed.

The quantity whose frequency of occurrence is given by the law of error as formulated above is the sum of many (m) elements. The elements are taken from (n) different groups, one from each. Each group may be regarded as described by a frequency curve in which the various values are assumed at random, but this randomness need not be absolute, and is of a kind that is very commonly found (p. 128). These frequency curves must have their successive moments of orders not higher than $m^{-\frac{1}{2}}$, m^{-1} , $m^{-\frac{3}{2}}$, where m is the number of elements contributing to each aggregate. In making up each aggregate the elements should be chosen independently from the various groups, but this independence need not be absolute. It is not necessary that the contributions from the same group to different aggregates should be independent, but every increase of dependency necessitates a larger number of aggregates before the law is fulfilled.

The preceding paragraph is highly condensed, and the reader must refer to the original for a more exact statement; in particular, the quantity may be some other function than the sum of the elements. Most of the conditions are obviously very generally realised, and on investigation it will be found that the most technical, that as to successive moments, is not at all prohibitive; is, for example, satisfied by numbers taken at random from mathematical tables, and by averages formed by samples taken at random from a group. (It is important to notice that independence

of elements is necessary when the precision of an average is by the usual calculated formula.)

Many statisticians must have felt surprise at the very great diversity of circumstances under which they have found the familiar shape of the curve of error appearing, and will feel their work on a much safer footing now that the law of error has been shown on theoretical grounds to have so wide a realm. They will, however, have many toilsome hours in studying in the paper before us the closeness of approximation which may be expected under given circumstances. This labour would be saved, and we should be very grateful to the author, if he would give analytical illustrations of cases where the second and third approximations may legitimately be expected, *a priori*, to give results of a certain precision.

The importance of this paper on the theoretical side is obviously very great, but in the present writer's opinion its importance for practical statistical work will in the end prove yet greater.

A.L.B.

Rates and Taxes as affecting Agriculture. By J. S. Nicholson, M.A., D.Sc. vi + 146 pp., crown 8vo. London: Swan Sonnenschein and Co., 1905.

In 1904 and 1905 Professor Nicholson delivered the Gilbey Lectures in the University of Cambridge. In both instances he has since communicated to a larger audience the thoughts embodied in his lectures; for in 1904 he published a little book on the History of the English Corn Laws, and in 1905 the present volume has appeared. The two publications are not without their connection with one another, and in the Preface to the later book Professor Nicholson says that "from one point of view it may be considered as supplementary to the earlier volume. The general conclusion of that work," he continues, "was to the effect that in their origins the various corn laws were reasonable from the standpoint of their time, but that under present conditions the ideas on which they were based are undesirable and impracticable." Similarly, in the case of the book before us, "the general conclusion of the present argument as affecting agriculture is that the continuance of the old system of local taxation imposes an inequitable burden on the agricultural interests, and indirectly is detrimental to the public good." In both instances we think that economic students have reason to be grateful to Professor Nicholson for enabling them thus to become acquainted with his matured conclusions. Familiarity with his more systematic treatises may have prepared them previously to expect a lucid exposition of any subject which he handled. They knew that they would find in his writings definite convictions forcibly expressed. They anticipated with a confidence, which is justified by the event, that he would suggest new points of view from which old questions might appropriately be regarded, and in the present volume, for example, we find him introducing with effect the extension made in his "Principles of Political Economy" of the canons of taxation to the cognate matter of expenditure.

But we are also met in both these little books by a

welcome breadth of view which is prepared to examine afresh the evidence adduced for accepted creeds, and is ready to abandon antiquated prejudice where it rests on insecure foundations. Professor Nicholson framed his verdict on the English Corn Laws in the true spirit of the historical method, and in doing so collided with certain opinions current among those with whom on other grounds he generally concurred. With no less firm a resolution to reach the real facts, he establishes in the present volume the important conclusion that the popular notion that historically all "land belonged to the Crown as representing the people," is a misleading survival of a legal fiction, and that it is a vulgar belief, no less unjustified by actual fact, to think that "by ancient custom taxes on land may be regarded as a hereditary burden." On the contrary, he argues that historical investigation shows that "the intention had always been to tax other forms of wealth equally with land, and that, as far as was practicable, the intention had been carried out." With regard to *national* taxes, land had until recently been deliberately favoured, partly because agriculture was held to be vitally important to the nation, and partly because land bore an undue share of *local* burdens. Even in the case of those *local* burdens the original purpose at which earlier legislation aimed had been the taxation of other forms of income equally with the rental derived from land, at any rate for such "onerous" charges as those typified by poor relief. Rates on houses and other varieties of rateable property were in effect or in intention local income taxes. From this historical argument the practical conclusion issues that, as local burdens for national charges have increased, and agriculture, so far from receiving any special corresponding benefit, has, in consequence of the fall in land values, become less able to bear the burden, it deserves "equitable treatment" in that "complete reorganisation of the whole system of local finance" which is required. This is the gist of the argument which Professor Nicholson expounds in the four chapters of this opportune brochure. In the first he discusses general principles, in the second he treats of national taxes, in the third of local taxes, and in the fourth and concluding chapter he investigates the incidence of taxes.

He makes a copious use of the Final Report of the Royal Commission on Local Taxation issued in 1901, although he forms an independent judgment upon the particular conclusions reached respectively by the Majority or the Minority of the Commissioners. He recognises the pertinence of the distinction drawn by the Commissioners between "onerous" local expenditure, which broadly coincides with that incurred for "national" purposes, and the "beneficial" expenditure which may be justly met by the locality over which the benefits extend, and even in a great measure charged definitely upon the particular individuals benefited. This distinction may, we believe, be described as an addition to the accepted terminology of fiscal economics. Similarly Professor Nicholson is in general agreement with the conclusion forced on the minds of the Commissioners, as of most students who have examined the past and present condition of the problem, that

hard necessity and the ends of equity have required the relief in increasing measure of local burdens by subsidies from the national exchequer. He himself adds some acute and sensible criticism upon the irrelevance to existing circumstance of some of the older objections put forward to that system.

But he also places the discussion of the whole question on a broader platform than that on which the Commissioners, in obedience to the terms of the reference made to them, necessarily remained. For, as he urges in his opening chapter, local taxation cannot be treated without the simultaneous consideration of national taxation, and in both equity must sometimes be subordinated to economy or convenience, and allowance made for sentiment, for history and custom; and in his final chapter he shows how important is the bearing of the incidence of taxation on the proper method and the fitting direction of reform, and accepted theories of incidence need revision in the light of altered circumstance, especially in connection with the diminution of the so-called "unearned increment" or the disappearance of agricultural "rent" in the strict meaning of the term. In fine, as in his previous book, Professor Nicholson has made a distinct enduring contribution to the elucidation of an obscure and complex problem. His lectures cannot accordingly be regarded as "occasional," and he has done well to embody them in the more permanent shape of published books.

L.L.P.

Working Women in Italy. [*Basi Tecniche di una Cassa di Maternità.* 1904. L. 0.75. *La Donna nell' industria italiana. Studi di demografia e di economia industriale.* 1905. L. 2.50. Published by the Ufficio di Lavoro at Rome.]

These two reports have been compiled by order of the Italian Government, in order to estimate the cost of founding a scheme of maternity insurance for factory women, in view of the possible loss of wages entailed by Article 6 of the Italian Factory Act (1902), which prohibits the employment of women within four weeks of the birth of a child. The Ufficio di Lavoro undertook a statistical investigation, limited in scope to the women coming under the operation of the Act, but otherwise to be of as thorough and comprehensive a character as possible, the object being to discover, *inter alia*, the average frequency of births among this particular class of women. The wages of female operatives for many industries were also recorded with great care and fulness. The lowest wage-earners occur most frequently in agricultural occupations and in paper-making, and least frequently among cigar-makers, cotton and woollen operatives. On the other hand, the highest wage-earners (over 2 lire) are absent from the agricultural workers, rarest among workers in silk, but relatively frequent among woollen workers, and most frequent among cigar-makers. The frequency of low wages increases from north to south; the frequency of high wages is greatest in Central Italy. Comparing the different firms according to the number of hands employed, it is found that low wages are most frequent in industries carried on on a small scale, and least so in

large factories ; high wages are most frequent in the great industry, and *vice versa*. For all industries the average wage of women workers stands thus :—

	75 Centesimi or Less.	76 to 100 Centesimi.	101 to 150 Centesimi.	150 to 200 Centesimi.	Over 200 Centesimi.
Earners expressed as per- centages of all female operatives over 15	12·3	28·0	40·7	13·4	5·6

For textile factories of different capacities we find the following particulars, wage-earners in percentages as before :—

Factories Employing	Centesimi per Day.					
	75 or Less.	76 to 100.	101 to 150.	151 to 200.	201 to 250.	Over 251.
Less than 20 workers	25·1	37·0	27·3	9·1	1·3	0·2
20 to 99 workers	20·5	38·4	33·6	5·5	1·5	0·5
100 „ 499 „	10·9	32·0	47·2	7·4	1·8	0·7
Over 500 „	5·0	15·6	44·6	26·9	6·2	1·7

The higher wages in the larger factories are the more remarkable, as these employ relatively a higher proportion of young girls between 15 and 20.

The large factories are shown also to maintain greater regularity of employment, as appears from the fourth set of tables, under the heading Textiles.

The final set of tables are devoted to elucidating the comparative fecundity of women in occupations. The materials for the estimate have been obtained by requesting employers to make returns showing the numbers and age of the women employed by them during a certain year (1st December, 1902, to 30th November, 1903), and how many, if any, of these gave birth to an infant during the period. The tables are arranged so as to show the district, the number of factories, the number of female operatives in age groups, the number married, and the number of births to every 100 women in the year. The percentage married in all the female operatives observed is 27·5, about half the proportion in the population generally. This however is, it is pointed out, an understatement of the comparative infrequency of married women workers ; for the working class commonly marry earlier than their social superiors, and the proportion of women married is larger than in the whole population. The proportion of female operatives who are married must therefore be considerably less than the proportion of married women in the female working class. This is easily explicable on both hands by the fact that manufacturers mostly prefer girls and single young women as employees, and that women more often than not prefer to quit work when they marry. In Italy in 1900 there

were 120 births to every 1,000 women between 15 and 54 years old, whereas among the female operatives of the inquiry there were only 45 per 1,000. It is claimed in the earlier report that, owing or mainly owing to the large number of young unmarried women employed in the great industry, the average fecundity of the working woman has been demonstrated to be of this relatively low degree, and that the evidence has disproved certain preconceived ideas of the high cost of maternity insurance. Whilst agreeing in the main with this view, we doubt whether sufficient attention has been given to the fact that the birth-rate here calculated is deduced entirely from returns furnished by manufacturers, who, especially in the case of large works, are frequently not acquainted with the family circumstances of their employees, and may not even know the women apart. Again, in the latest report of the Chief Lady Inspector of our own Factory Department it is pointed out that unconscientious employers, if it suits their convenience, will purposely ignore the fact of a birth, and that some poor working women are so needy as to dissemble it for the sake of employment. In this way we think it probable that some births have been omitted, either from negligence or intention, and that the birth-rate calculated in the tables may be based on too low a figure. The difference perhaps is not very important. The statistical and sociological world should be extremely indebted to the Ufficio di Lavoro for the publication of reports so original, so elaborate, and so well thought out and combined. In Germany it has even been suggested that they may throw light on the important question of the effect of occupations on the growth of population. (*Soziale Praxis*, 17th August, 1905.) It should be remembered, however, that the tables were compiled for a definite practical object, and the inquiry was strictly limited to women in actual employment in manufacture within a given short period. The height of the birth-rate calculated on these lines probably has little relation to the physiological effect of occupations, but merely shows, it may be, which occupations are preferred by married women, or are found by them to yield the best opportunities of employment. For the immediate purpose of the inquiry this was the important point, but in order to arrive at the effect of occupations on the birth-rate, it would be necessary to study the conditions under which girls and women are employed from their youth up, and the industries to which they give their best years. It may be hoped that the present reports will induce emulation in our own country, and lead to a demand both for the collection of similar data by our Labour Department, and for the promotion of some form of maternity insurance.

Some regrettable misprints have crept into the headings of the tables in the earlier report, but these are easily corrected by an attentive reader. Thus, the head of column 11 should evidently read $\frac{\text{col. 10}}{\text{col. 6}}$ *not* $\frac{\text{col. 9}}{\text{col. 6}}$; the head of column 13 should read $\frac{\text{col. 12}}{\text{col. 7}}$; and the two last columns should read $\frac{\text{col. 12}}{\text{col. 10}}$.

B.L.H.

La Comédie Protectionniste. By Yves Guyot. xi + 466 pp., crown 8vo. Paris: Bibliothèque-Charpentier, 1905.

M. Yves Guyot tells us in the Preface to this interesting book, that his selection of a title was prompted by a wish to discover what might be termed "gai" and "facile," in preference to a more severe description, like "La Tyrannie Protectionniste," or "L'Oligarchie Protectionniste," or a tragic appellation like "La Besogne Homicide." He does not indeed dismiss these aspects of his subject, and one of the sections of the book is expressly devoted to the discussion of the "murderous enterprise" to which, as he maintains, protectionists have applied their mischievous or misguided energy. An unkindly critic might perhaps object that his evident anxiety to traverse the entire area of the controversy between free traders and protectionists has resulted in some appearance of diffuseness and some want of systematic consecutive treatment. We are taken from the history of the changes made in the French tariff, described in detail in the first section, to a rapid comparison of what the author distinguishes as the industries protected and the industries oppressed by the fiscal system now obtaining in his country. This second portion of the subject is treated with a brevity scarcely commensurate with the perplexities attaching to all inquiries like this, which attempt to analyse the complicated consequences attending the operation of a plurality of causes. With a readiness which hardly perhaps consists with the stress placed in a later section on the difficulty of obtaining and the trouble of interpreting the figures recording the movements of trading intercourse, or with the discreet sagacity which in the discussion of the sugar bounties, also handled in a chapter of the book, separates M. Guyot from extreme free traders like the late Lord Farrer, in this second section he traces all the evil he can discover directly to protection, and ascribes all the good which meets his eye to other influences. In the following section he uses the most recent physiological calculations about the quantity and the character of the food needed to sustain the efficiency of human beings, to prove the inadequacy of the supplies of bread and meat in France, when regulated by a protective policy, to meet the demand. In the next two sections he accuses his opponents, not merely of sacrificing, in the spirit of an "oligarchy," the interests of nineteen persons out of every twenty to the remaining individual, but he even lays at their door the reproach of the infantile mortality of great towns and of the country districts.

By an abrupt transition we are then introduced to a critical account of the programme of Mr. Chamberlain, which fills the succeeding hundred pages, and absorbs about a quarter of the book. This examination is avowedly hostile. The tone is controversial rather than judicial; but, while English fiscal reformers may think that M. Guyot does not always represent their views with just exactitude, they may nevertheless admire the vigorous confidence with which he believes, and pronounces, that the movement has failed; and they will be prepared to admit that in his person "convinced free traders" possess an energetic and redoubtable ally.

When M. Guyot has thus "slain the slain," he passes, by another quick transition, to consider the protective policy of the United States and of Germany, and then, after a review of tariff statistics which is at once informing and suggestive, the more serious mood is exchanged for a lighter vein, in which the fancies and illusions of M. Méline are amusingly set forth. The "postulates" of protection are then contrasted with the "realities" of economies, and in a concluding section M. Guyot expounds his own programme of action for the immediate present. When a new Liberal Government has been placed in office in this country, he would have his own country bargain for the suppression of its "surtaxes d'entrepôt," in return for a diminution of our duties upon imported wines. This proposal, like his attitude towards the sugar bounties, shows that M. Guyot is not one of those bigoted free traders who, for the sake of theoretical consistency, would throw away opportunities of procuring in practice an enlargement of the area of free trade.

But he is none the less so thorough a believer in the economic faith which he professes, that he can only explain the unwillingness or inability of his opponents to admit its truth by ignorance or prejudice, and their success in influencing others by the power, unscrupulously exercised, which belongs to riches. The external observer may perhaps wonder how it is that the French people permit the interests of nineteen out of every twenty persons to be sacrificed to those of the remaining individual. But M. Guyot has no doubt that this is the case. He is equally convinced that the prosperity of the United States has been achieved not in consequence but in spite of protection, and he is no less sure that Mr. Chamberlain must be wrong because he is seeking to substitute what is "artificial" for what is "natural." It may, he allows, be true that in seasons of abundance the price of wheat in France is not affected by the duty upon that commodity to its full extent, but in seasons of scarcity the mischief occasioned is, he argues, even greater in degree than the amount of the tax itself. If, again, an increase in the exports of certain French goods has followed protection, it has, he thinks, really been due to independent circumstances, while on the other hand the over-production of certain other goods is unquestionably due in his opinion to protection alone. In short, while many modern economists, believing in the practical superiority of a fiscal policy of free trade, might raise doubts about its theoretical completeness, M. Guyot is troubled by no misgivings of this character. He feels a compassionate contempt for the intellectual shortcomings of protectionists, and relishes the congenial but easy work of exposing their multitudinous fallacies. This task he performs with such evident gusto that he secures from the outset, and retains to the finish, the attention and interest of his readers, and his presentation of his case can hardly be equalled, and certainly cannot be surpassed, for that ease and gaiety which he desiderates. In spite of his skill and vigour, he may not always convince all his readers, but that he has fairly earned and fully justified the title he has chosen, no one who takes up this captivating volume will deny when he lays it down. L.L.P.

Institutions for Thrift. Two Lectures delivered before the University of Liverpool School of Training for Social Work on 17th and 24th February, 1905. By Sir E. W. Brabrook, C.B. London: P. S. King and Son. Price 6d.

There is no one living better qualified than Sir Edward Brabrook to write on the subject of thrift organisation, and the Liverpool University School of Training for Social Work was fortunate in securing such an exponent to deliver these two lectures. His former book on the subject, "Provident Societies and Industrial Welfare," was published in 1898. This small work carries our information to a later date, and puts the matter in a form which will appeal to students who approach economics from the sociological side.

In the first lecture, "Institutions for Thrift by way of Investment" are dealt with; in the second, "Institutions for Thrift by way of Insurance," and thus we have a useful classification under two main sections. The institutions under the first section are given as "Savings Banks," "Penny Savings Banks," "Collecting Savings Banks," "Trustee Savings Banks," "Post Office Savings Banks," "Building Societies," and "Industrial and Provident Societies." Under the second we have "Collecting Burial Societies," "Friendly Societies," "Trade Unions," and "Workmen's Compensation Funds." To trace the growth of Savings Banks is an interesting piece of work by itself. We have presented to us the anomalies created by the first legislation in regard to these—anomalies created by fixing the rate of interest allowed by the State at 4l. 11s. 3d. per cent. This turned out to be above the market rate for similar security. The consequence was that the State became a heavy loser, and we are told that by 1844, twenty-seven years after the Savings Banks Acts became law, the loss to the nation amounted to 2,200,000l. Other unforeseen consequences were brought about; for though the Acts were passed "to benefit the poorer and more defenceless portion of society," we learn from Lewins, in his "History of Savings Banks," that the rich took advantage of the good security, and "one gentleman possessed of 40,000l. was known to have deposited large sums of money in one Savings Bank in the names of his six children." The difficulty was surmounted by reduction of interest, and provisions to meet any possible future losses by annual votes; but Sir Edward warns us that the question of a further reduction of interest from the 2½ per cent. at present allowed will have to be faced; it is only delayed on account of the depreciation of the credit of the nation.

The "Liberator crash," which resulted in the ruin of so many persons, hindered the growth of Building Societies, but it procured the Building Societies Act of 1894, which instituted many legislative checks, and has produced results which, in Sir Edward's opinion, have been "wholly satisfactory." At the date of the delivery of the lectures there existed 2,124 societies on an improved financial basis, with 601,000 members and nearly 41,000,000l. capital. Though the Act of 1894

prohibited balloting for loans in these societies, it is of interest to note that it did not do so in that class of institution known as "Bond Investment Companies," and it has needed a special Departmental Committee to point out to the legislature that any system of payment "by chance or lot" should, in the interest of the public, be subject to legislative control.

Sir Edward devotes special attention to Friendly Societies. Much has been written respecting their origin, and they have frequently been traced back to the early civilization of the Chinese. We are on safer ground when we notice in these pages that in 1555 there existed a society named the Incorporation of Carters of Leith, with 57 members and 7,081*l.* in funds; and in 1634 the United General Sea Box of Borrowstounness is mentioned as having 45 members with 7,898*l.* The important question of actuarial valuation is dealt with in a way which should be of special use to the social worker who may wish to select and recommend particular societies. We are told that when deficiencies do appear—when the present value of future contributions and funds in hand is less than the present value of future benefits promised—no society need despair of retrieving its position. Reform can be brought about by adopting the recommendations of a competent valuer; and in recommending a society one has to learn not only what may be the present financial position, but also, if in deficiency, whether the advice of the valuer has been adopted.

Sir Edward does not appear to approve of the ethics of the Taff Vale judgment. Before the British Association he stated that he did not question its legality, but called it "serious and unexpected." In these pages he points out that "the Act of 1871 expressly withheld from Trade Unions the privileges of incorporation," and urges that "they ought to be exempt from its disabilities." As the Act vests the property of the unions in Trustees, and a breach of trust would be an injury to the union, "how then can the whole body of members be thought to have sanctioned an illegal act of their officers?"

The total funds of all the institutions dealt with in these lectures present no mean figures. Societies registered under the Friendly Societies Acts show, with trade unions and workmen's compensation schemes, a capital of 53,107,000*l.*, and as the institutions under the head of "Investment" own 329,000,000*l.*, we have a grand total of 382,000,000*l.* These figures do not include unregistered societies nor co-operative societies. D.R.S.

The British Trade Year-Book, covering the twenty-five years 1880-1904, and showing the course of trade. By John Holt Schooling. xxviii + 335 pp., royal 8vo. London: John Murray, 1905. Price 10*s.* 6*d.* net.

The title of this book seems a little misleading; "Year Book" suggests a volume which is essentially a work of reference and absolutely requires annual revision. This is, on the contrary, a survey, by a special method, of trade statistics for the past quarter of a century, with a lengthy text of a controversial

character. It is in no way specially adapted as a work of reference, and there does not seem to be any reason for attempting an annual issue.

The statistics are examined on a common plan throughout, viz., by giving averages of successive decades (1880-89, 1881-90, 1882-91, &c.) so as to exhibit the general trend apart from fluctuations of short period. Figures for single years are either not given at all or only quite exceptionally. The tables of decadal averages are also illustrated by diagrams, somewhat roughly drawn and a little unpleasant to read, owing to the "curves" being drawn on a blank white background without any squares. The method of averages used, as such, is good, and the volume gives a very wide survey of many aspects of trade. The first chapter deals briefly with imports (general, special, from foreign countries, from British possessions, &c.), the second with exports, and the succeeding chapters with bullion and specie, the excess of imports, manufactured goods, foreign trade, foreign countries' imports, taxes on imports, our colonial trade, international comparisons, the leading articles of export, and so forth. The chief omission, and it is a serious one, is the complete absence of data with respect to price changes. The necessity for giving such data is dismissed by Mr. Schooling with characteristic curttness. "The orthodox economic-method of using 'index numbers' to adjust the values of imports and exports is not only a purely arbitrary method, which leads to most erroneous conclusions, but it is also quite unnecessary. For a little reflection will show anyone whose mind is not entangled by traditions of ancient habit, that . . . the factor of fluctuation in prices ought to be retained . . . and not got rid of." A footnote that follows suggests that Mr. Schooling is not very familiar with price index numbers, indeed with index numbers in general, and cannot have thought out the principles of their use.

The style throughout cannot be said to be consistent with the statement in the Preface that "this book is not a contribution to the fiscal controversy" (p. xxviii); it is frequently very political. "Our so-called Free Trade is a sham; our sacrosanct Free Food does not exist, and never has existed; . . . we have no regard for Fair-play for our Trade; and we neglect our Trade by the Foolish policy of *laissez-Faire*. We give more attention to economic Fancy than to economic Fact, and we are content to be Fooled by a Fantasy of Fallacious capital F's!" (p. 328). It is a pity that a series of useful tables should be burdened with this very unstatistical sort of rhetoric. For a real year-book, giving a good collection of trade statistics, accompanied only by such notes as were necessary for their elucidation, there would seem to be a real want—a want hardly supplied by the "statistical abstracts." Such a year-book (if unofficial) should be edited discreetly and judiciously, but in the present volume these qualities are sadly lacking. G.U.Y.

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*November—*Il costo degli scioperi per la classe lavoratrice: *G. Montemartini*. La contabilità delle municipalizzazioni di pubblici servizi: *Ricardo Bachi*. Il movimento della popolazione Italiana in rapporto al prezzo dei cereali: *F. Corridore*.

La Riforma Sociale, 1905—

*September—October—*Lo sviluppo ed i profitti delle società per azioni italiane dal 1882 al 1903: *Cesare Jarach*. La questione della carriera dei sottufficiali: *C. L. Malaguzzi Valeri*. Il colono dell' antipiano milanese e le sue condizioni di vita: *Omero Schiassi*. Le imposte dirette nell' esercizio finanziario 1903-04: *Spectator*.

*November—*La riforma della legislazione italiana sulle strade ferrate: *Filippo Tajani*. Polemica Intorno al Dazio sul Grano. L'ordinamento moderno professionale degli studi politici e sociali: *Giovanni Gorrini*. L'inchiesta sul rifornimento dell' Inghilterra in tempo di guerra: *A. Raffalovich*.

*December—*La distribuzione topografica delle società per azioni italiane e l'incremento relativo della piccola e grande industria: *C. Jarach*. L' Industria Politica dello Zucchero: *E. Giretti*. I progenitori dell' organizzazione professionale in Inghilterra: *G. Prato*. Produzioni dei metalli preziosi e le questioni monetarie: *A. Raffalovich*.

SWITZERLAND—

Journal de Statistique Suisse, 1905—

Lieferung 4—Eine thurgauische Dorfgemeinde: *E. Hofmann*. Thurgauische Lehrerstiftung: *G. Schweizer*. Beiträge zu einer thurgauischen Rechtsstatistik: *Aepli*. Der thurgauische landwirtschaftliche Verein: *A. Schmid*.

Lieferung 5—Viehhaltung und Viehzucht im Kanton Thurgau seit 1803: *A. Mühlebach*. Volkszahl und Freizügigkeit in der Schweiz: *E. Heitz*. Statistische Zusammenstellung über die Anstalt Bernrain: *E. Rüegger*. Die Strassenbahn Frauenfeld-Wil: *A. Ammann*. Die Arbeiterkolonie Herdern in den Jahren 1895 bis 1904: *H. Kesselring*.

Lieferung 6—Postcheck und Postgiro: *J. Buser*. État des prix des denrées alimentaires et autres les plus importantes, mars 1905: *C. Zuppinger*. Der Finanzhaushalt des Kantons Thurgau in den Jahren 1803-1903: *B. Böhli*.

IX.—*Quarterly List of Additions to the Library.*

Additions to the Library during the Quarter ended 15th December, 1905, arranged alphabetically under the following heads:—(a) Foreign Countries; (b) India and Colonial Possessions; (c) United Kingdom and its Divisions; (d) Authors, &c.; (e) Societies, &c. (British); (f) Periodicals, &c. (British).

The Society has received, during the past quarter, the current numbers—either quarterly, monthly, or weekly—of the periodical official publications dealing with the following subjects:—

Consular Reports—From United States and United Kingdom.

Labour Reports, &c.—From Austria-Hungary, Belgium, France, Germany, Italy, United States, New York State, Canada, New Zealand, and United Kingdom.

Trade Returns—From Argentina, Austria-Hungary, Belgium, Bulgaria, China, Denmark, Egypt, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Roumania, Russia, Spain, Sweden, Switzerland, United States, India, Canada, and United Kingdom.

Vital Statistics—From Argentina, Egypt, Germany, Italy, Netherlands, Roumania, Switzerland, United States (Connecticut and Michigan only), Queensland, South Australia, and United Kingdom.

Vital Statistics of following Towns—Buenos Ayres, Buda-Pesth, Brünn, Prague, Brussels, Copenhagen, Berlin, Bucharest, Moscow, Madrid, London, Manchester, Dublin, Edinburgh, and Aberdeen.

The Society has received during the past quarter the current numbers of the following unofficial Periodicals and Publications of Societies, &c., which are arranged under the Countries in which they are issued :—

Denmark—Nationalökonomisk Tidsskrift.

France—Annales des Sciences Politiques. Économiste Français. Journal des Économistes. Monde Économique. Polybiblion, Parties Littéraire et Technique. Réforme Sociale. Le Rentier. Revue d'Économie Politique. Revue de Statistique. Journal de la Société de Statistique de Paris.

Germany—Allgemeines Statistisches Archiv. Archiv für Sozialwissenschaft und Sozialpolitik. Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirtschaft. Jahrbücher für Nationalökonomie und Statistik. Zeitschrift für die gesamte Staatswissenschaft. Zeitschrift für die gesamte Versicherungs-Wissenschaft. Zeitschrift für Socialwissenschaft. Mittheilungen aus der Handelskammer Frankfurt a. M.

Italy—L'Economista. Giornale degli Economisti. Rivista Italiana di Sociologia. Riforma Sociale. Societa Umanitaria, Bollettino mensile.

Sweden—Ekonomisk Tidskrift.

Switzerland—Journal de Statistique suisse.

United States—American Journal of Sociology. Bankers' Magazine. Bradstreet's. Commercial and Financial Chronicle, with supplements. Journal of Political Economy. Political Science Quarterly. Quarterly Journal of Economics. Yale Review. American Academy of Political and Social Science, Annals. American Economic Association, Publications. American Geographical Society, Bulletin. American Statistical Association, Quarterly Publications. American Philosophical Society, Proceedings and Transactions. Columbia University, Studies in History, &c.

India—Indian Engineering. Asiatic Society of Bengal, Journal and Proceedings.

Canada—The Chronicle: Insurance and Finance.

New Zealand—Government Insurance Recorder. Trade Review and Price Current.

United Kingdom—The Accountant. Accountants' Magazine. Athenæum. Australian Trading World. Bankers' Magazine. Broomhalls' Corn Trade News. Browne's Export List. Colliery Guardian. Commercial World. Economic Journal. Economic Review. Economist. Fireman. Incorporated Accountants' Journal. Insurance Record. Investors' Monthly Manual. Investors' Review. Joint Stock Companies' Journal. Labour Co-partnership. Licensing World. Local Government Journal. Machinery Market. Nature. Navy League, Journal. Policy-Holder. Post Magazine. Produce Markets' Review. Public Health. Publishers' Circular. Sanitary Record. Shipping World. Statist. The Times. Tuberculosis. Anthropological Institute, Journal. Cobden Club, Leaflets. East India Association, Journal. Howard Association, Leaflets, &c. Institute of Actuaries, Journal. Institute of Bankers, Journal. Institution of Civil Engineers, Minutes of Proceedings. Iron and Steel Institute, Journal. Lloyd's Register of British and Foreign Shipping, Statistical Tables. London Chamber of Commerce, Journal. London University Gazette. Manchester Literary and Philosophical Society, Memoirs and Proceedings. Royal Agricultural Society, Journal. Royal Colonial Institute, Proceedings and Journal. Royal Geographical Society, Geographical Journal. Royal Irish Academy, Proceedings and Transactions. Royal Meteorological Society, Meteorological Record and Quarterly Journal. Royal Society, Proceedings. Royal United Service Institution, Journal. Sanitary Institute, Journal. Society of Arts, Journal. Statistical and Social Inquiry Society of Ireland, Journal. Surveyors' Institution, Professional Notes and Transactions. Trade Circulars.

(a) Foreign Countries.

Argentine Republic—

Agricultura. Ministerio de. Boletín mensual de Estadística y Comercio. (Current numbers).....	} The Ministry of Agriculture
Anuario de la Dirección General de Estadística correspondiente al año 1904. (Contains Trade Returns for 1904.) Tomo 1. Svo. 1905	
Población. Movimiento de, correspondiente a los años 1903 y 1904 por Provincias y Territorios. 8 pp., fol. 1905	} The "Dirección"
Buenos Ayres (Province). Dirección General de Estadística. Boletín mensual. (Current numbers) }	
Córdoba (Province)—	} The Provincial Statistical Bureau
Geografía de la Provincia de Córdoba. 2 vols., Svo. 1904-05	
Geografía de la Provincia de Córdoba. Atlas. 1905. La. fol. 1905	} The Compañía Sud-Americana de Billetes de Banco
Santa Fe. Anuario Estadístico de la Ciudad de: Año 1. 1904. Svo. 1905	
Tucumán. Movimiento de población de la ciudad de Tucumán. (Current numbers.) Cards.....	} The Municipal Statistical Bureau
Ackerbau-Ministeriums. Statistisches Jahrbuch für 1904. Heft 2. Der Bergwerksbetrieb Österreichs im Jahre 1904. Lief. 2. Bergwerksverhältnisse (mit Ausnahme der Bergwerksproduktion). Naphthastatistik. Schlagwetterstatistik. Svo. 1905	
Bleivergiftungen in hüttenmännischen und gewerblichen Betrieben. Ursachen und Bekämpfung. Teil. 2. Bericht über Erhebungen in Bleiweiss- und Bleioxydfabriken. Fol. 1905	} The Ministry of Agriculture
Eisenbahnstatistik. Österreichische, für 1904. Teil 1, Hauptbahnen und Lokalbahnen. La. fol. 1905	
Mitteilungen des k.k. Finanz-Ministeriums. Jahrgang 11. Heft 2. Svo. 1905	} The Austrian Labour Department
Österreichisches Wirtschaftspolitisches Archiv (vormals "Austria"). (Current numbers.) Svo.	
Gewerblichen Betriebszählung vom 3 Juni, 1902. Ergebnisse der. Hefte 8, 10, 11. Fol. 1905	} The I. and R. Ministry of Railways
Österreichisches Statistisches Handbuch. Jahrgang 23, 1904. Svo. 1905	
Post- und Telegraphenwesens im Jahre 1904. Statistik des österreichischen. Svo. 1905	} The Ministry of Finance
Statistische Monatschrift. (Current numbers).....	
Statistische Nachrichten aus dem Gesamtgebiete der Landwirtschaft. (Current numbers)	} The Ministry of Commerce
Strafanstalten und der Gerichts-Gefängnisse. Statistische Übersicht der Verhältnisse der österreichischen, in 1902 und 1903. Fol. 1905	
Unterrichtsanstalten. Statistik der, für 1902-03. Fol. 1905	} The Central Statistical Commission
Viehählung vom 31 Dezember, 1900. Abteilung 2. Verhältniszahlen. Fol. 1905.....	
Volkszählung vom 31 Dezember, 1900. Ergebnisse der. Heft 5. Die Haushaltungs- und Familienstatistik in den Grossstädten. Anhang. Sterblichkeitstafeln österreichs auf Grund der Volkszählung vom 31 Dezember, 1900. Fol. 1905	} The I. and R. Ministry of Commerce
Zivilrechtspflege in 1902 und 1903. Ergebnisse der. Fol. 1905	
Hungary. Dénombrement de la Population en 1900. 4 ^e Partie. Statistique professionnelle détaillée. 6 ^e Partie. Heures de travail, ainsi que salaires des employés, &c. 2 vols., Svo. 1905	} The Central Statistical Bureau

(a) **Foreign Countries—Contd.****Austria-Hungary—**

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| <i>Bohemia.</i> Statistischen Landesamtes des Königr.
Böhmen. Mitteilungen des: Band VI. Heft 2.
Band VII. Heft 1. Svo. 1905 | } The Bureau |
| <i>Budapest.</i> Monatshefte des Budapester Communal-
Statistischen Bureaus. (Current numbers) | |

Belgium—

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| <i>La Belgique.</i> 1830-1905. Institutions-Industrie-
Commerce. Svo. 1905 | } The Ministry of In-
dustry and Labour |
| <i>Fabrication des Produits Chimiques proprement dits.</i>
Svo. 1905 | |
| <i>Les Industries à Domicile en Belgique.</i> Volume vii.
<i>L'Industrie de la Bonneterie. L'Industrie de la</i>
<i>Cordonnerie à Herve.</i> Svo. 1905 | } The Belgian Labour
Department |
| <i>Mines. Annales des Mines de Belgique.</i> (Current
numbers) | |
| <i>Brussels.</i> Rapport Annuel. Demographie-Hygiène-
Salubrité Publique.-Statistique Médicale. Année
1904. Svo. 1905 | } The "Service d'Hy-
giène," Brussels |
| <i>Académie Royale de Belgique. Bulletin de la classe</i>
<i>des lettres.</i> . . 1905. (Current numbers) | |

Bulgaria—

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| <i>Commerce. Statistique du Commerce de la Bulgarie</i>
<i>avec les pays étrangers, mouvement de la navigation</i>
<i>et prix moyens annuels des animaux domestiques,</i>
<i>des principaux articles alimentaires et des journées</i>
<i>pendant 1904.</i> 4to. 1905 | } The Statistical Bu-
reau |
| <i>Écoles secondaires, spéciales et professionnelles et</i>
<i>l'école des hautes-études. Statistique des, pendant</i>
<i>l'année scolaire 1897-98.</i> 4to. 1905 | |
| <i>Émigration de la Principauté dans les pays étrangers</i>
<i>de 1893 à 1902, Statistique de l'.</i> Fol. 1905 | } The Direction de
Statistique |
| <i>Maladies contagieuses chez les animaux domestiques</i>
<i>dans la Principauté. Résultats des, pendant 1894-</i>
<i>1903.</i> 4to. 1905 | |

China—

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| <i>Customs Gazette.</i> (Current numbers) | } Sir Robert Hart,
Bart., G.C.M.G. |
| <i>Returns of Trade and Trade Reports for 1904.</i>
<i>Part 1, Report on the working of the Post Office</i>
<i>for 1904.</i> 4to. 1905 | |

Cuba—

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| <i>Boletín del Centro General de Comerciantes e Indus-</i>
<i>triales.</i> Svo. (Current numbers) | } The National Lib-
rary, Havannah |
| <i>Comercio exterior.</i> 2º Semestre de 1904 y año 1904.
4to. 1905 | |
| <i>Departamento de Telégrafos. Memoria Estadística.</i>
<i>Año fiscal de 1904 a 1905.</i> Svo. 1905 | |

Denmark—

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| <i>Annuaire Statistique.</i> 10 ^e année, 1905. Svo. 1905 | } The State Statistical
Bureau |
| <i>Causes de décès dans la population urbaine du</i>
<i>royaume. Aperçu des, 1890-99.</i> 4to. 1905 | |
| <i>Communications Statistiques.</i> 4 ^e Série. Tome 18.
Svo. 1905 | |
| [Contains Statistics of Marriages and Returns of Poor
relieved in 1901.] | |
| <i>Finances du Danemark, 1887-88—1903-04.</i> 4to.
1905 | |

(a) Foreign Countries—Contd.

Denmark—Contd.

Importation et Exportation du Danemark en 1904.	The State Statistical Bureau
4to. 1905	
Marine marchande et Navigation du Danemark, 1904.	The Municipal Statistical Bureau
4to. 1905	
<i>Copenhagen.</i> Aarsberetning angaaende Sundhedstilstanden i Kobenhavn for 1904. 4to. 1905	

Egypt—

Infectious Diseases notified throughout the country and deaths occurring from the same in towns and villages in each quarter of 1904. Fol. 1905	The Sanitary Department
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France—

Annuaire Statistique. 24 ^e volume, 1904. 8vo. 1905	The French Labour Department
Agriculture. Ministère de l'. Bulletin mensuel de l'Office de Renseignements agricoles. (Current numbers.) 8vo.	
Chemins de fer Français au 31 Décembre, 1903. Statistique des; Documents divers. Part 1. Intérêt Général. France, Algérie et Tunisie. 4to. 1905	The Ministry of Public Works
Chemins de Fer de l'Europe. Situation au 1 ^{er} Janvier, 1905. Ouvertures en 1904. 5 pp., fol. 1905	
Commerce et Navigation. Tableau général du. Année 1904. Vol. 1. Commerce de la France avec ses Colonies et les puissances étrangères. Fol. 1905	The French Government
Finances. Ministère des. Bulletin de Statistique et de Législation comparée. (Current monthly numbers)	
Institutions d'Assistance. Statistique Annuelle des, année 1903. 8vo. 1905	The French Labour Department
Monnaies et Médailles. Administration des, Rapport au Ministre des Finances. 10 ^e année, 1905. 8vo. 1905	
Prisons. Statistique Pénitentiaire pour l'année 1903. La. 8vo. 1905	The French Government
Travail. Conseil supérieur du. L'enseignement professionnel en France. Rapport de M. Briat. 4to. 1905	
Travail. Statistique des Grèves et des Recours à la Conciliation et à l'Arbitrage survenus pendant 1904. 8vo. 1905	The French Labour Department

Germany—

Deutsche Justiz-Statistik. Jahrgang XII. 8vo. 1905....	Reichs-Justizamt
Gesundheitsamtes. Veröffentlichungen des Kaiserlichen. (Current numbers.) 1905	The Imperial Health Bureau
Handel. Auswärtiger Handel des deutschen Zollgebiets im Jahre 1904. Teil 1. Hefte 4, 7, 14, 15, 16, 18, 20, 21, 22, 23, & 24. Fol. 1905	
Streiks und Aussperrungen im Jahre 1904. 4to. 1905	The Imperial Statistical Bureau
Vierteljahrshefte zur Statistik des Deutschen Reichs. Jahrgang 1905. Heft 3. 4to.	
Verband Deutscher Städtestatistiker. Verhandlungsbericht über die am 12 und 13 Mai 1905 in der städtischen Tonhalle zu Düsseldorf abgehaltene XIX Konferenz der Vorstände Statistischer Ämter Deutscher Städte. Fol. 1905	The Statistical Bureau of Düsseldorf

(a) Foreign Countries—Contd.

Germany—Contd.

- Prussia.* Zeitschrift des K. Preussischen Statistischen Landesamts. (Current numbers)..... } The Royal Prussian Statistical Bureau
- Saxony.* Zeitschrift des K. Sächsischen Statistischen Landesamts. (Current numbers)..... } The Statistical Bureau of Saxony
- Berlin—*
- Arbeiter-Kranken-Versicherung in Berlin im Jahre 1904. Fol. 1905..... }
- Geburten, die Aufgebote und Eheschliessungen, die Ehescheidungen, die Sterbefälle und Meldungen von ansteckenden Krankheiten, sowie die Zuzüge und Fortzüge, ferner die Neubauten und Abbrüche von Häusern im Jahre 1904 in Berlin, sowie die zu Anfang 1905 in Berlin leerstehenden Wohnungen. Fol. 1905..... } The Municipal Statistical Bureau
- Statistisches Jahrbuch der Stadt Berlin. 29 Jahrgang, enthaltend die Statistik des Jahres 1904 (zum Teil auch 1905). 8vo. 1905..... }
- Frankfurt.* Frankfurter Verein für Geographie und Statistik Jahresberichte. 1903-04 und 1904-05. 8vo. 1905..... } The Society
- Hamburg.* Hamburgs Handel und Schiffahrt, 1904. La. 4to. 1905..... } The German Consul-General, London
- Almanach de Gotha. 1906..... } Purchased
- Archiv für Rassen- und Gesellschafts—Biologie. (Current numbers). 8vo. 1905..... } The Editor
- Verein für Socialpolitik—*
- Verfassung und Verwaltungsorganisation der Städte. Band 4. Heft 1. Königreich Sachsen. Mit Beiträgen von G. Häpe, R. Heinze, I. Ludwig-Wolf, I. Hubschmann. 8vo. 1905.... } Purchased
- Verfassung und Verwaltungsorganisation der Städte. Band 4. Heft 2. Königreich Württemberg, von Dr. E. Springer. 8vo. 1905..... }

Italy—

- Emigrazione e Colonie. Raccolta di Rapporti dei RR. Agenti Diplomatici e Consolari. Volume 1. Europa. Parte 3. Germania-Lussemburgo-Belgio-Olanda-Stati scandinavi-Russia-Peninsula balcanica. 8vo. 1905..... } Ministry Foreign Affairs, Emigration Department
- Movimento Commerciale nell' anno 1904. In 3 volumes. Fol. 1905..... } The "Direzion Generale delle Gabelle"
- Movimento della Popolazione secondo gli atti dello stato civile nell' anno 1903. Matrimoni, Nascite e Morti. 8vo. 1905..... } The Director-General of Statistics

Japan—

- The World's Yearbook. Compiled by Mr. Ukoku Ito (Tokio). (In Japanese.) 8vo. 1904... } Count Yamagisawa

Mexico—

- Boletín de Estadística fiscal. (Current monthly numbers.) Fol. 1905..... }
- Estadística fiscal. Datos relativos. (Current numbers)
- Boletín demográfico de la República Mexicana, 1902. Año 7. No. 7. La. 8vo. 1905..... } The Statistical Bureau
- [Births, deaths and marriages, and causes of deaths in 1902.]
- Censo y Division Territorial, 1900. Estados de Campeche y Veracruz. 2 parts, la. 8vo. 1904..... }

(a) Foreign Countries—*Contd.***Mexico—*Contd.***

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| Resumen General del Censo de la Republica Mexicana.
Verificado el 28 de Octubre de 1900. 79 pp., Svo.
1905 | } The Statistical Bureau |
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Netherlands—

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| Jaarcijfers voor het Koninkrijk der Nederlanden.
Rijk in Europa 1904. Svo. 1905 | } The Central Statistical Bureau |
| Maandcijfers. (Current numbers.) Svo. 1905 | |
| Revue du Bureau Central de Statistique du Royaume
des Pays-Bas. 12 ^{me} Livraison, 1905. Svo. 1905
[Wages and hours of labour in different trades. Strikes
and lock-outs. Retail prices of bread and food.] | |
| Elections. Kiezersstatistiek benevens aanvulling der
Verkiezings-statistiek voor de Staaten-Generaal en
voor den Gemeenteraad in 1905. (No. 60.) Svo.
1905 | |
| Justice. Justitiële Statistiek, Jaar 1904. 4to. 1905 | |
| Labour. Statistique du jugement des contraventions
des lois sur le travail et la sûreté des ouvriers
en 1904. (No. 61.) Svo. 1905 | } The Central Statistical Bureau |
| Population. Statistiek van den loop der bevolking in
Nederland over 1904. (No 62.) Svo. 1905 | |
| Savings Banks. Spaar- en Leenbanken. Statistiek
der, Jaar 1903. 4to. 1905 | |
| Trade. Statistiek van den In-, Uit-, en Doorvoer over
het Jaar 1904. Gedeelte 2. Fol. 1905 | } The Department of Finance |

Norway—

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| Assistance publique pour 1901-02. Statistique de l.
(112.) Svo. 1905 | } The Central Statistical Bureau | |
| État économique des préfectures pendant 1896-1900.
Rapports. I. (106.) Svo. 1905 | | |
| Electorale, Statistique, 1903. (109.) Svo. 1905 | | |
| Commerce. Statistique du, de la Norvège en 1904.
(115.) Svo. 1905 | | |
| Finances des Communes pendant 1901. (108.) Svo.
1905 | | |
| Instruction publique en 1902. Statistique (114.)
Svo. 1905 | | |
| Mines et Usines en Norvège en 1901-03. Statistique.
(113.) Svo. 1905 | | |
| Mouvement de la Population pendant 1896-1900.
Partie 2 ^e . Résumé. (117.) Svo. 1905 | | |
| Navigation de la Norvège en 1903. (110.) Svo. 1905 | | |
| Recensement du 3 Décembre, 1900. Livr. 5. (Popu-
lation classée par professions.) (111.) Svo. 1905 | | |
| Successions, faillites et biens pupillaires en 1902.
(107.) Svo. 1905 | | |
| Vétérinaire, Service, et inspection de la viande en
1903. Compte rendu. (116.) Svo. 1905 | | |
| Journal du Bureau Central de Statistique. (Current
numbers.) Svo. 1905 | | } The Bureau |
| Christiania. Beretning fra Kristiania sundhedskom-
mission og Kristiania kommunale sygehuse for aaret
1904. Svo. 1905 | | } Medical Officer of Health for Chris-
tiania |

Panama—

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| Boletín Estadística, Publicación Trimestral, Año 1,
No. 3, 1905. 4to. 1905 | } The "Secretaria de Fomento" |
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(a) Foreign Countries—Contd.

Portugal—

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| Pescas Maritimas no Continente do Reino e ilhas adjacentes. Estatistica das, no anno de 1903. Fol. 1905 | } The Director-General of Statistics |
| Colonies. Album de Estatistica Graphica dos Caminhos de Ferro do Ultramar 1903. Fol. 1905 | |

Roumania—

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| Institutului International de Statistica. Raport asupra sesiunei a X ^a . a, tinută la Londra de la 31 Iulie la 5 August St. N. 1905. By Dr. L. Colescu. 17 pp., Svo. 1905 | } The Author |
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Russia—

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| Prices of Grain at Ports. Return of (in Russian). Sheets. (Current numbers)..... | } The Ministry of Finance |
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Spain--

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| Comercio Exterior de España en 1904. Estadística general del ; in 2 vols. Fol. 1905 | } The Director-General of Customs |
| Estadística del Impuesto de Transportes por Mar. (Current numbers.) Svo. 1905 | |

Sweden—

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| <i>Bidrag till Sveriges Officiella Statistik, 1905—</i> | |
| B. Rattsvesendet, 1903. (Justice.) Fol. 1905.... | } The Central Statistical Bureau |
| L. Statens Järnvägstrafik, 1904. (Railways.) Fol. 1905 | |
| M. Postverket, 1904. (Postal.) Fol. 1905 | |
| P. Undervisningsvesendet, 1902. (Education.) Fol. 1905 | |
| V. Brannvins Tillverkning, &c., 1903-04. (Brandy and Beet Sugar.) Fol. 1905 | |

Labour—

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| Försäkringsväsendet i Riket år 1903. 2. Mindre svenska samt Utlandska Försäkringsanstalter. Försäkringsinspektionens underdåniga berättelse beträffande. Svo. 1905 | } The University of Upsala |
| Meddelanden från k. Kommerskollegii afdelning för Arbetsstatistik. No. 3, 1905. Svo. 1905.....
[Prices of commodities, wages, and numbers employed.] | |
| Yrkesinspektionens Verksamhet år 1904. Svo. 1905 | |
| General-Sammandrag öfver 1904 års Bevilling . . . inkomstskatten samt samma års beviljningsafgifter . . . Fol. 1905..... | } The Central Statistical Bureau |
| Kapital-Konto till Riks-hufvud-boken för år 1904. Fol. 1905 | |
| Öfversigt de solidariska bankbolagens och bankaktiebolagens bokslut för år 1904. 4to. 1905 | |
| Öfversigt af Sveriges Riksbanks Ställning sammanfattad efter 1904 års bokslut. Fol. 1905 | |
| Riksstat för år 1906. Svo. 1905 | |
| Rikets In- och Utförsel. (Current numbers) | |
| Sammandrag af de enskilda sedelutgifvande bankernas. (Current numbers) | |
| Sammandrag af Riksbankens Ställning. (Current numbers) | |
| Statistisk Tidskrift. (Current numbers) | |
| Uppgifter om Hypoteksbanken och Hypoteksföreningarna för år 1904. Fol. 1905 | |

(a) Foreign Countries—*Contd.***Sweden—*Contd.***

- Stockholm.* Berättelse om Allmänna Hålsotill-
standet i Stockholm under året 1903, och under
året 1904. 2 parts. 4to. 1904-05..... } The Municipal Sta-
tistical Bureau

Switzerland—

- Alcools. Données statistiques concernant la gestion
de la Régie fédérale des Alcools en 1904. Fol.
1905 } The "Régie"
Alcools. Rapport sur la gestion et le compte de la
Régie des Alcools pour 1904. 8vo. 1905 }
Commerce. Statistique du Commerce de la Suisse
avec l'Étranger en 1904. La. fol. 1905 } The Federal Depart-
ment of Customs
Commerce. Statistique du Commerce Suisse. Rap-
port annuel, 1904. 8vo. 1905 }
Recensement fédéral des entreprises agricoles, in-
dustrielles et commerciales, 9 août, 1905. Resultats
provisoires du. 4to. 1905 } The Federal Statisti-
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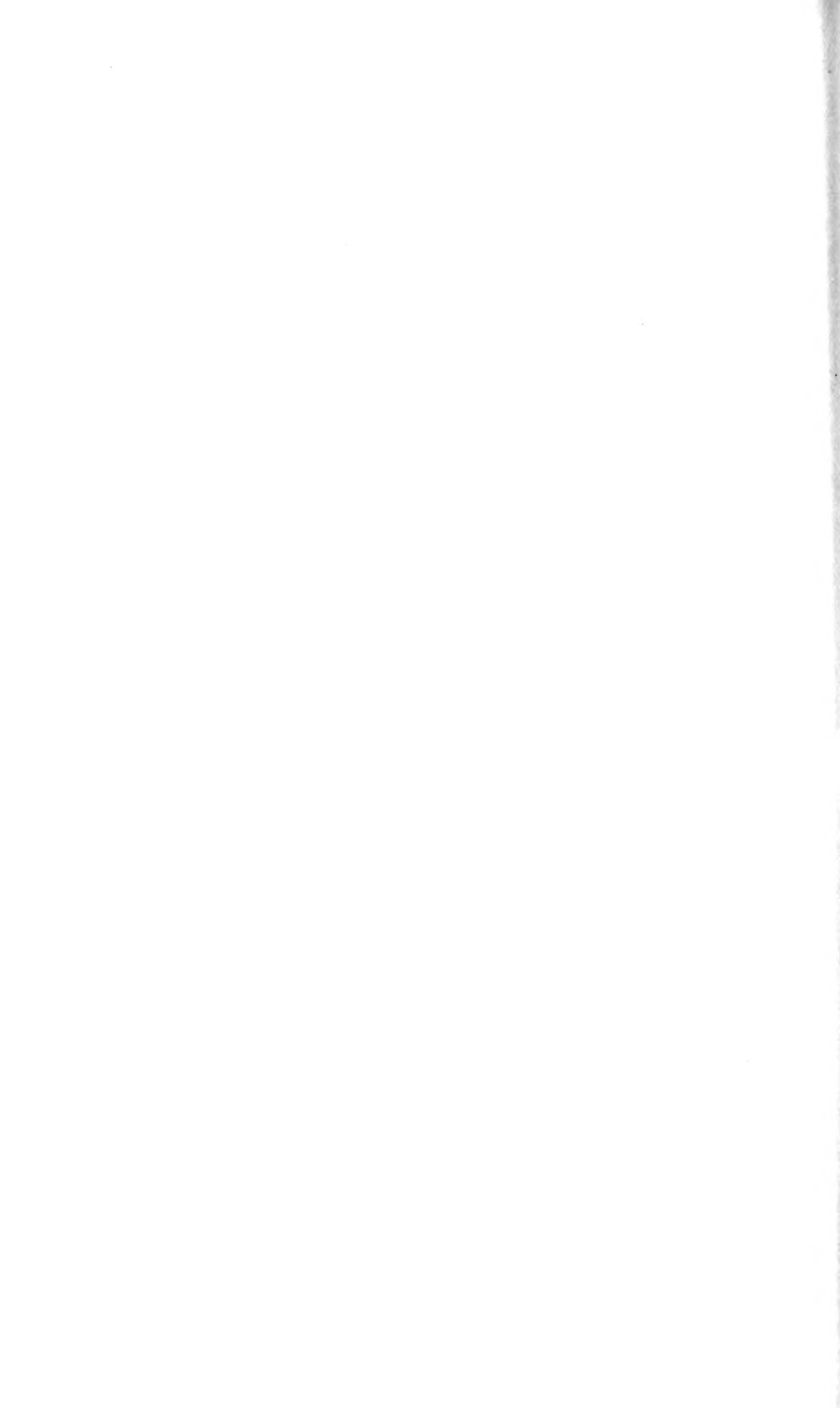
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(Corrected to 31st December, 1905.)

ROYAL STATISTICAL SOCIETY.

(FOUNDED 1834. INCORPORATED 1887.)

9, ADELPHI TERRACE,
STRAND, W.C., LONDON.

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Printers in Ordinary to His Majesty.

1905.

ROYAL STATISTICAL SOCIETY.

Patron.

HIS MOST GRACIOUS MAJESTY THE KING.

Honorary President.

H.R.H. THE PRINCE OF WALES, K.G.

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(having filled the Office of President).

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ROYAL STATISTICAL SOCIETY.

NO. 9, ADELPHI TERRACE, STRAND, W.C., LONDON.

NOTICES TO FELLOWS.

December, 1905.

THE Council desire to call the attention of the Fellows to the fact that notwithstanding the change in the name of the Society by the addition of the word "Royal," they are still, in using letters after their names, signifying the membership of the Society, only entitled under Rule 6, to use the letters F.S.S.

ANNUAL Subscriptions are due in advance, on the 1st of January in each year. A Form for authorising a Banker or Agent to pay the Subscription Annually, will be forwarded on application to the Assistant Secretary. When convenient, this mode of payment is recommended. Drafts should be made payable to the order of "The Royal Statistical Society," and crossed "*Drummond and Co.*"

To be included in the Ballot at any particular Ordinary Meeting, the Nomination Papers of Candidates for Fellowship must be lodged at the Office of the Society at least six days before the date of such Meeting.

FELLOWS who may desire to receive Special and Separate Notices of each Paper to be read before the Society at the Ordinary Meetings, should indicate their wishes to the Assistant Secretary.

THE Ordinary Meetings of the Society are held at 5 p.m., in most cases at **The Society's Rooms, 9, Adelphi Terrace, W.C.**

Particulars of the Papers to be read, and of the time and place of Meeting, will always be found in an advertisement on that page of the "**Times**" which faces the leading articles, on the Saturday preceding the holding of the Meeting. The advertisement also appears in other London Daily Papers at the same time, and to these announcements the attention of Fellows is particularly directed.

THE *Journal* is issued on the last day of the months of March, June, September, and December in each year. Copies are delivered *carriage free* to all Fellows of the Society. Arrangements have been made for their delivery to those Fellows resident in London and the suburbs by Messrs. Carter Paterson & Co., and to most provincial Fellows by post. All copies for Colonial and Foreign Fellows are sent by mail. The *Journals* should reach British Fellows within the first fourteen days of the months of April, July, October, and January respectively, and those resident abroad somewhat later, on account of the time occupied in transmission. Addressees who fail to receive their *Journals* at the proper time are earnestly requested to communicate with the ASSISTANT SECRETARY without delay, as the carriers cannot be expected to investigate complaints or be responsible for loss unless prompt notice be given.

THE Library and the Reading Room are open daily for the use of Fellows from 10 a.m. to 5 p.m., excepting on Saturdays, when they are closed at 2 p.m.

It is requested that any change of address may be notified promptly to the ASSISTANT SECRETARY.

CALENDAR FOR THE SESSION 1905-06

1905	MON.	TUES.	WED.	THURS.	FRI.	SATUR.	SUN.	1906	MON.	TUES.	WED.	THURS.	FRI.	SATUR.	SUN.
NOV.	...	...	1	2	3	4	5	MAY	...	1	2	3	4	5	6
	6	7	8	9	10	11	12		7	8	9	10	11	12	13
	13	14	15	16	17	18	19		14	15	16	17	18	19	20
	20	21	22	23	24	25	26		21	22	23	24	25	26	27
	27	28	29	30					28	29	30	31			
DEC.	...	...	...	...	1	2	3	JUNE	...	...	...	...	1	2	3
	4	5	6	7	8	9	10		4	5	6	7	8	9	10
	11	12	13	14	15	16	17		11	12	13	14	15	16	17
	18	19	20	21	22	23	24		18	19	20	21	22	23	24
	25	26	27	28	29	30	31		25	26	27	28	29	30	
1906 JAN.	1	2	3	4	5	6	7	JULY	...	...	...	...	...	...	1
	8	9	10	11	12	13	14		2	3	4	5	6	7	8
	15	16	17	18	19	20	21		9	10	11	12	13	14	15
	22	23	24	25	26	27	28		16	17	18	19	20	21	22
	29	30	31						23	24	25	26	27	28	29
									30	31					
FEB.	...	...	...	1	2	3	4	AUG.	...	...	1	2	3	4	5
	5	6	7	8	9	10	11		6	7	8	9	10	11	12
	12	13	14	15	16	17	18		13	14	15	16	17	18	19
	19	20	21	22	23	24	25		20	21	22	23	24	25	26
	26	27	28						27	28	29	30	31		
MAR.	...	...	...	1	2	3	4	SEP.	...	...	...	...	...	1	2
	5	6	7	8	9	10	11		3	4	5	6	7	8	9
	12	13	14	15	16	17	18		10	11	12	13	14	15	16
	19	20	21	22	23	24	25		17	18	19	20	21	22	23
	26	27	28	29	30	31			24	25	26	27	28	29	30
APR.	...	...	...	...	...	...	1	OCT.	1	2	3	4	5	6	7
	2	3	4	5	6	7	8		8	9	10	11	12	13	14
	9	10	11	12	13	14	15		15	16	17	18	19	20	21
	16	17	18	19	20	21	22		22	23	24	25	26	27	28
	23	24	25	26	27	28	29		29	30	31				
	30														

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The latest arrangements as to Papers and Meetings up to the time of going to press will be found at page vii in each issue of the *Journal*.

THE ANNUAL GENERAL MEETING

WILL BE HELD ON TUESDAY, THE 19TH JUNE, 1906, AT THE SOCIETY'S ROOMS.

Programme of the Session 1903-6.

THE

ORDINARY MEETINGS

WILL BE HELD

IN THE MONTHS OF NOVEMBER TO JUNE

IN MOST CASES

AT THE SOCIETY'S ROOMS,
9, Adelphi Terrace, Strand, W.C., London.

The Chair will be taken at 5 p.m. on the following dates:—

Tuesday, Jan. 16.	Tuesday, April 24.
„ Feb. 20.	„ May 15.
„ March 20.	„ June 19.

SEE NOTE ON THE OPPOSITE PAGE.

The following Papers have been read this Session:—

- “Statistical Skimmings from the International Congress.” By SIR J. ATHELSTANE BAINES, C.S.I. (Read 14th November, 1905.)
- “The Decline of Human Fertility in the United Kingdom and other Countries as shown by Corrected Birth-rates.” By ARTHUR NEWSHOLME, M.D., and T. H. C. STEVENSON, M.D. (Read 19th December, 1905.)
- “On the Marriage-rate and the Birth-rate and their changes during the latter half of the Nineteenth Century.” By G. UDNY YULE. (Read 19th December, 1905.)

The following Papers have been offered; and from these and from others that may yet be offered, a selection will be made by the Council:—

- The President's Address. By the Right Hon. the EARL OF ONSLOW, G.C.M.G.
- “The Recent Course of Shipping Freights.” By SIR THEO. V. S. ANGLIER.
- “Wages in the Engineering and Shipbuilding Trades in the Nineteenth Century.” By A. L. BOWLEY, M.A., and G. H. WOOD.
- “Dealings in Futures in the Cotton Market.” By Professor S. J. CHAPMAN, M.A., and DOUGLAS KNOOP.
- “The Influence of the United States Steel Corporation on Prices.” By Dr. HERMANN LEVY.
- “Statistics of Population and Pauperism in England and Wales, 1851-1901.” By C. S. LOCH.
- “The Financial and Fiscal System in India.” By J. E. O'CONOR C.I.E.
- “Railway Finance.” By J. RUSSELL SOWRAY.
- “The Development of Danish Agriculture.” By R. J. THOMPSON.
- “On the Growth of London during the Nineteenth Century, with some information as to the distribution and progress of Population in the surrounding Counties.” By T. A. WELTON.

ROYAL STATISTICAL SOCIETY:

AN OUTLINE OF ITS OBJECTS.

THE *Royal Statistical Society* was founded, in pursuance of a recommendation of the British Association for the Advancement of Science, on the 15th of March, 1834; its objects being, the careful collection, arrangement, discussion and publication, of facts bearing on and illustrating the complex relations of modern society in its social, economical, and political aspects,—especially facts which can be stated numerically and arranged in tables;—and also, to form a Statistical Library as rapidly as its funds would permit.

The Society from its inception has steadily progressed. It now possesses a valuable Library of about 40,000 volumes, and a Reading Room. Monthly meetings are held from November to June, which are well attended, and cultivate among its Fellows an active spirit of investigation; the Papers read before the Society are, with an abstract of the discussions thereon, published in its *Journal*, which now consists of sixty-eight annual volumes, and forms of itself a valuable library of reference.

The Society has originated and statistically conducted many special inquiries on subjects of economic or social interest, of which the results have been published in the *Journal*, or issued separately.

To enable the Society to extend its sphere of useful activity, and accomplish in a yet greater degree the various ends indicated, an increase in its numbers and revenue is desirable. With the desired increase in the number of Fellows, the Society will be enabled to publish standard works on Economic Science and Statistics, especially such as are out of print or scarce, and also greatly extend its collection of Foreign works. Such a well-arranged Library for reference as would result does not at present exist in England, and is obviously a great *desideratum*.

The Society is cosmopolitan, and consists of Fellows and Honorary Fellows, forming together a body, at the present time, of about *one thousand* Members.

The Annual Subscription to the Society is *Two Guineas*, and at present there is no entrance fee. Fellows may, on joining the Society, or afterwards, compound for all future Annual Subscriptions by a payment of *Twenty Guineas*.

The Fellows of the Society receive gratuitously a copy of each part of the *Journal* as published quarterly, and have the privilege of purchasing back numbers at a reduced rate. The Library (reference and circulating), and the Reading Room, are open daily for the convenience of Members.

Nomination Forms and any further information will be furnished, on application to the *Assistant Secretary, Royal Statistical Society, 9, Adelphi Terrace, Strand, W.C., London*.

ROYAL STATISTICAL SOCIETY.

LIST OF THE SOCIETY'S PUBLICATIONS.

Note.—Sets—or Copies of any number—of the *Journal*, or of the other Publications of the Society (if not out of print), can be obtained at the Offices of the Royal Statistical Society, 9, Adelphi Terrace, Strand, W.C., or through any bookseller.

	Price
Journal (published quarterly)— Vols. 1—68. 8vo. 1838-1905	5s. each part*
General Analytical Index to Vols. 1—50 of the Journal (1838-87). In 4 parts. 8vo.— (i) For Vols. 1—15 (1838-52) (ii) For Vols. 16—25 (1853-62) (iii) For Vols. 26—35 (1863-72) (iv) For Vols. 36—50 (1873-87)	
	7s. 6d.
	3s. 6d. each part
Subject-Index to the Journal, Vols. 28—57, 1865-94	
	1s. 6d.
First Report of a Committee on Beneficent In- stitutions. 1. The Medical Charities of the Metropolis. 68 pp. 8vo. 1857	2s. 6d.
Statistics of the Farm School System of the Continent (reprinted from the <i>Journal</i> , with a Preface and Notes). 63 pp. 8vo. 1878...	
	1s.
Production and Consumption of Meat and Milk in the United Kingdom. Reports of Com- mittee appointed 20th November, 1900, to Inquire into Statistics Available as a Basis for Estimating Production and Consumption of Meat and Milk in United Kingdom; with observations by Mr. R. H. Rew. 8vo. 1904)	1s.
Catalogue of the Library— iv + 573 pp. Cloth, super royal 8vo. 1884 }	
	10s.
Index to the Catalogue of 1884— i + 372 pp. Cloth, super royal 8vo. 1886 }	10s.
Jubilee Volume— xv + 372 pp. Cloth, 8vo. 1885	
	10s. 6d.
List of Fellows, Rules and Bye-Laws, Regu- lations of the Library, and Outline of the Objects of the Society, &c. Corrected annually to 31st December. 8vo. }	Issued gratuitously

NOTE.—One or two numbers of the *Journal* and Part ii of the Index are now out of print.

* Before 1870 the price varied.

ROYAL STATISTICAL SOCIETY.

LIST OF THE Society's Guy Medallists, *With the Date of the Awards.*

THE GUY MEDAL

Has been awarded in GOLD to—

1892. Mr. CHARLES BOOTH. | 1894. Sir ROBERT GIFFEN.
1900. Mr. J. A. BAINES.

In SILVER to—

NAME.	FOR HIS PAPER ON
1893. Sir JOHN GLOVER.	<i>*Tonnage Statistics of the Decade, 1880-1890.</i>
1894. Mr. A. SAUERBECK.	<i>Prices of Commodities during the last Seven Years.</i>
1895. Mr. A. L. BOWLEY.	<i>Changes in Average Wages (Nominal and Real) in the United Kingdom between 1860 and 1891.</i>
1897. Mr. FRED. J. ATKINSON.	<i>Silver Prices in India.</i>
1899. Mr. CHARLES S. LOCH.	<i>Poor Relief in Scotland: its Statistics and Development, 1791-1891.</i>
1900. Mr. R. F. CRAWFORD.	<i>Notes on the Food Supply of the United Kingdom, Belgium, France, and Germany.</i>
1901. Mr. T. A. WELTON.	<i>Distribution of Population in England and Wales in the Period of Ninety Years from 1801 to 1891.</i>
1902. Mr. R. H. HOOKER.	<i>Suspension of the Berlin Produce Exchange, and its effect on Corn Prices.</i>
1903. M. YVES GUYOT.	<i>The Sugar Industry on the Continent.</i>
1904. Mr. D. A. THOMAS, M.P.	<i>The Growth and Direction of our Foreign Trade in Coal during the last Half Century.</i>
1905. Mr. R. HENRY REW.	<i>Reports of the Committee on Meat and Milk Production.</i>

* This paper was one of a series which now contains five decennial reviews.

ROYAL STATISTICAL SOCIETY.

LIST

OF THE

Society's Howard Medallists.

NAME OF MEDALLIST	SUBJECT OF COMPETITION.
1875. Mr. EDWARD SMITH.	<i>Influence of improved Dwellings of the Poor in Rural Districts of England.</i>
1876. Dr. J. C. STEELE.	<i>Past and Present Mortality of Hospitals in the United Kingdom.</i>
1878. Dr. JOHN MARTIN and Captain H. HILDYARD (<i>extra Prize</i>).	<i>Effects of Health and Disease on Military and Naval Operations.</i>
1879. Miss B. JOURDAN.	<i>Improvements in Education of Children in Eighteenth and Nineteenth Centuries.</i>
1880. Mr. H. P. POTTER.	<i>The Oriental Plague, and Howard's Labours on the subject.</i>
1881. Dr. F. POLLARD.	<i>On the Jail Fever, from the earliest Black Assize to the latest Outbreak.</i>
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9, Adelphi Terrace, Strand,

London, W.C.

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Founded 15th March, 1834, Incorporated 31st January, 1887.

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Year of Election.		
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1900		Ablett, Cecil Gerard, <i>1, Guardian Chambers, Port Elizabeth.</i>
1888		Ackland, Thomas G., F.I.A., <i>10, Church-crescent, Muswell-hill, Highgate, N.</i>
1888	<i>c d p</i>	Acland, The Right Hon. Arthur Herbert Dyke, M.A., <i>Westholme, Scarborough.</i>
1898		Acland, Sir C. Thomas Dyke, Bart., <i>Killerton, Exeter.</i>
1892	<i>c d p</i>	ACWORTH, WILLIAM MITCHELL, M.A., <i>3, Park-place, St. James's, S. W.</i>
1905	<i>d</i>	Adams, W. G. S., M.A., <i>Dept. of Agri. and Tech. Instruction, Dublin.</i>
1891		Addington, Right Hon. Lord, <i>21, Prince's-gate, S. W.</i>
1902	<i>d</i>	Adeane, Charles Robert Whorwood, <i>Babraham Hall, near Cambridge.</i>
1890		Adler, Marcus Nathan, M.A., F.I.A., <i>22, Craven-hill, W.</i>
1884		Agius, Edward Tancred, <i>3, Belsize-grove, N. W.</i>
1879		Akers-Douglas, The Right Hon. Aretas, M.P., <i>Chilston-park, Maidstone, Kent.</i>
1896	<i>d</i>	Allan, Francis John, M.D., <i>Westminster City Hall, Charing Cross-rd., W. C.</i>

Year of Election.		
1889		Allen, Frank, J.P., 73, <i>Tinakori-road</i> , <i>Wellington</i> , <i>N.Z.</i>
1896		Allen, George Berney, <i>Free Chase</i> , <i>Warminglid</i> , <i>Hagyard's Heath</i> .
1899	d	Allen, Richard James, <i>Cotton Assocn., Ltd.</i> , <i>St. Mary's-gate</i> , <i>Manchester</i> .
1898		Allen, William Henry, <i>Bromham House</i> , <i>Bromham</i> , <i>near Bedford</i> .
1880		*Allerton, The Right Hon. Lord, <i>Chapelallerton</i> , <i>Leeds</i> .
1893		Anderson, Herbert William, <i>Fairfield</i> , <i>Broom-road</i> , <i>Teddington</i> .
1889		Anderson, John Andrew, <i>Faversham</i> , <i>Kent</i> .
1886		Andras, Henry Walsingham, F.I.A., 50, <i>Regent-street</i> , <i>W.</i>
1902	d	Angier, Sir Theodore Vivian Samuel, <i>Exchange Chambers</i> , <i>St. Mary Ave</i> , <i>E.C.</i>
1871		Angus, R. B., <i>Montreal</i> , <i>Canada</i> .
1897		Anning, Edward Herbert, F.R.G.S., 78, <i>Cheapside</i> , <i>E.C.</i>
1884		Anning, Edward James, 78, <i>Cheapside</i> , <i>E.C.</i>
1872		*Archibald, William Frederick A., M.A., 114, <i>Royal Courts of Justice</i> , <i>Strand</i> , <i>W.C.</i>
1892		Argyle, Jesse, 67, <i>Mildmay-park</i> , <i>N.</i>
1904		Arkövy, Richard, 65, <i>Fazsi Utcza</i> , <i>Budapest</i> .
1897		Arnold, William, 11, <i>Albion-street</i> , <i>Hanley</i> , <i>Staffs.</i>
1888		Asch, William, 7, <i>Lothbury</i> , <i>E.C.</i>
1900		Aston, William Henry, 46, <i>Eagle Wharf-road</i> , <i>New North-road</i> , <i>N.</i>
1888	d	Atkinson, Charles, 56, <i>Palewell-park</i> , <i>East Sheen</i> .
1893	d p	Atkinson, Frederic J. (<i>Deputy Auditor General</i>), <i>c/o King, King & Co.</i> , 45, <i>Pal Mall</i> , <i>S.W.</i>
1892		*Atkinson, Robert Hope, 332, <i>South 4th Avenue</i> , <i>Mt. Vernon</i> , <i>N.Y.</i> , <i>U.S.A.</i>
1865	e d p	AVEBURY, RIGHT HON. LORD, F.R.S. (<i>Honorary Vice-President</i>), <i>High Elms</i> , <i>Farnbro'</i> , <i>R.S.O.</i> , <i>Kent</i> .
1904		Avery, John, A.C.A., 23, <i>St. Swithin's-lane</i> , <i>E.C.</i>
1893		Aves, Ernest, M.A., <i>Lower Birtley</i> , <i>Witley</i> , <i>Surrey</i> .

Year of
Election.

1872	<i>c d</i>	*Babbage, Major-General Henry Prevost, <i>Mayfield, Lansdown, Cheltenham.</i>
1872		*Backhouse, Edmund, <i>Trebah, Falmouth.</i>
1892		Bacon, George Washington, F.R.G.S., <i>127, Strand, W.C.</i>
1855	<i>c d</i>	BAILEY, ARTHUR HUTCHESON, F.I.A., <i>26, Mount Ephraim-road, Streatham, S.W.</i>
1900		Baily, James Thomas Herbert, <i>56, Charing Cross, S.W.</i>
1881	<i>c d p</i>	BAINES, SIR JERVOISE ATHELSTANE, C.S.I. (<i>Hon.</i> <i>Foreign Secretary and Vice-President</i>), <i>Kidlington, Oxon.</i>
1887		*Baldwin, Alfred, M.P., <i>Willden House, Stourport, Worcestershire.</i>
1878		Balfour, The Right Hon. Arthur J., M.P., F.R.S., <i>10, Downing-street, S.W.</i>
1886		Balfour, The Right Hon. Gerald William, M.P., <i>3, Whitehall Court, S.W.</i>
1903	<i>d</i>	Bamber, Lieut.-Col. Charles James, D.P.H., <i>Sanitary Comm. to Gov. of the Punjab, Lahore.</i>
1904		Banaji, Khoshru Nowrosji, <i>Baltantine Lodge, Ahmedabad, Bombay Presy.</i>
1881	<i>d</i>	*Barfoot-Saunt, William Henry, <i>Orcender Hall, Market Harborough, Leicestershire.</i>
1902		Barham, Sir George, <i>Snape, Wadhurst, Sussex; and Dancharst,</i> <i>Hampstead.</i>
1887		Barnes, Joseph Howard, F.I.A., <i>70, Lombard-street, E.C.</i>
1885		Barratt, Thomas J., <i>75, New Oxford-street, W.</i>
1887		*Barrett, Thomas Squire, F.Z.S., M.A.I., &c., <i>Rose Cottage, Millfield-road, Widnes.</i>
1888		*Bartlett, Frederick W., <i>Paymaster General's Office, Whitehall, S.W.</i>
1903		Barton, Edwin, <i>29, Corporation-street, Manchester.</i>
1889	<i>d</i>	Bastable, Professor C. F., M.A., LL.D., <i>6, Trevelyan-tr., Brighton-rd, Rathgar, Co. Dublin.</i>

Year of Election.		
1877	<i>c d p</i>	BATEMAN, SIR ALFRED EDMUND, K.C.M.G. (<i>Honorary Vice-President</i>), <i>Woodhouse, Wimbledon-park.</i>
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1873		*Baynes, Alfred Henry, F.R.G.S., <i>19, Furnival-street, Holborn, E.C.</i>
1875	<i>d</i>	*Beardsall, Francis E. M., <i>42, Winifred-road, Urmston, nr. Manchester.</i>
1875	<i>d</i>	*Beaufort, William Morris, F.R.A.S., F.R.G.S., <i>18, Piccadilly, W.</i>
1905		Beaven, Edwin Sloper, <i>5, Borcham-terrace, Warminster.</i>
1882	<i>d</i>	*Beazeley, Michael Wormum, M.A., <i>Worting, Basingstoke.</i>
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1882	<i>c d</i>	*Beeton, Henry Ramie (18, <i>Austin Friars, E.C.</i>) <i>9, Maresfield-gardens, Hampstead, N. W.</i>
1899	<i>d</i>	Beeton, Mayson M., B.A., <i>Horsey Hall, Norfolk.</i>
1886	<i>d</i>	Begg, Ferdinand Faithfull, <i>Bartholomew House, E.C.</i>
1890		Bell, Frederick, F.I.A., <i>47, Chancery-lane, W.C.</i>
1892	<i>d</i>	Bell, Frederick William, <i>P.O. Box 5,666, Johannesburg, Transvaal.</i>
1884	<i>d</i>	Bell, James T., <i>330, Mansfield-road, Nottingham.</i>
1901	<i>d</i>	Bellingham, Archer, <i>6, Mauderille-place, W.</i>
1878	<i>d p</i>	Beuce-Jones, Henry R., B.A., <i>Board of Trade, 1, Whitehall, S. W.</i>
1897		Bennett, William, <i>City Mutual Life Ass. Soc., Melbourne.</i>
1888		*Benson, Godfrey R., <i>23, The Grove, Boltons, S. W.</i>
1884		*Bentley, Richard, F.R.G.S., <i>Upton, Slough, Bucks.</i>
1884	<i>d</i>	Berg, Wilhelm, <i>21, Mincing-lane, E.C.</i>
1890		Berry, Arthur, M.A., <i>King's College, Cambridge.</i>
1891		Berry, Oscar, C.C., F.C.A., <i>Monument House, Monument-square E.C.</i>
1900		Bethell, Alfred James, <i>Middlesthorpe Lodge, Dringhouses, York.</i>
1875		Bevan, Thomas, <i>Stone-park, near Dartford, Kent.</i>
1869	<i>p</i>	*Beverley, The Hon. Mr. Justice Henry, <i>Nascot Lodge, Watford.</i>

Year of Election.		
1891	d	Biddle, Daniel, M.R.C.S., L.S.A., <i>Charlton Lodge, Kingston-on-Thames.</i>
1888		Billinghurst, Henry F., <i>7, Oakcroft-road, Blackheath, S.E.</i>
1899	c	BIRCHENOUGH, HENRY, M.A., C.M.G., <i>79, Eccleston-square, S.W.</i>
1901		Bird, Harry, C.C., <i>Strathmore, Chingford, Essex.</i>
1881		Bishop, George, <i>113, Powis-street, Woolwich.</i>
1902		Bisset-Smith, George Tulloch, <i>55, Carlton-place, Aberdeen.</i>
1898		Blount, Edward Thomas Joseph, F.F.A., A.I.A., <i>Standard Insurance Co., Shanghai, China.</i>
1898	c d	*BLYTH, SIR JAMES, BART., <i>Stansted, Essex.</i>
1884	d	Boileau, John Peter H., M.A., M.D., &c. (Lieut.- <i>Col., Army Medical Staff), Trowbridge, Wilts.</i>
1881		Bolitho, Thomas Robins, <i>Trengvaunt, Hea Moor, R.S.O., Cornwall.</i>
1887		Bolling, Francis, <i>2, Laurence Pountney-hill, E.C.</i>
1890		Bolton, Edward, J.P., <i>325, Anlaby-road, Hull.</i>
1885	c d	*Bonar, James, M.A., LL.D., <i>Civil Service Commission, Burlington-gardens, W.</i>
1887		Bond, Edward, M.P., <i>Elm Bank, Hampstead, N.W.</i>
1905		*Bonn, Max J., <i>43, Park Lane, W.</i>
1885	c d p	BOOTH, RT. HON. CHARLES, D.C.L., D.Sc., F.R.S. (Hon. Vice-President), <i>8, Adelphi-terrace, Strand, W.C.</i>
1899	d	Bourne, Arthur (<i>Equitable Life Office</i>), <i>120, Broadway, New York, U.S.A.</i>
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1879		Bowley, Edwin, <i>29, Croftdown-road, Highgate-road, N.W.</i>
1894	c d p	BRAEBROOK, SIR EDWARD WILLIAM, C.B., F.S.A., <i>178, Bedford-hill, Balham, S.W.</i>
1883		Braby, Frederick, F.C.S., F.G.S., <i>Bushey Lodge, Teddington.</i>
1875		Braby, James, J.P., <i>Eaton Lodge, 1, Cromwell-road, Hove, Sussex.</i>
1900	d p	Branford, Victor Verasis, M.A., <i>5, Old Queen-street, Westminster, S.W.</i>
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Year of Election.		
1903	<i>d p</i>	Brassey, The Hon. Thomas A., <i>Park-gate, Battle.</i>
1864		*Braye, The Right Hon. Lord, <i>Stanford Hall, Market Harborough.</i>
1902	<i>d</i>	Broadbent, Albert, <i>19, Oxford-road, Manchester.</i>
1883		Brooke, C. B., <i>16, Leadenhall-street, E.C.</i>
1874		Broom, Andrew, A.C.A., <i>Eaglehurst, Staines, Middlesex.</i>
1895	<i>d</i>	Broomhall, George James Short, <i>17, Goree Piazas, Liverpool.</i>
1905		Brothers, Orlando Frank, <i>Box 1163, Johannesburg.</i>
1878		Brown, Sir Alexander Hargreaves, Bart., M.P., <i>12, Grosvenor-gardens, S.W.</i>
1901		Brown, B. Hal., <i>London & Lancs. Life Ins. Co., Montreal, Canada.</i>
1896		*Brown, Daniel Maclaren, junr., <i>P.O. Box 187, Corra Linn, Port Elizabeth</i>
1893		Brown, James William Bray, F.S.A.A., <i>Corporation-street, Birmingham; and Moseley, Worcestershire.</i>
1903	<i>d</i>	Brown, Samuel Stanley, <i>Hamilton House, Victoria Embankment, E.C.</i>
1901		Browne, Henry Doughty, J.P., <i>10, Hyde Park-terrace, W.</i>
1875	<i>p</i>	Browne, Thomas Gillespie C., F.I.A., <i>11, Lombard-street, E.C.</i>
1903		Brownfoot, Harry Allison, <i>32a, Mosley-street, Newcastle-on-Tyne.</i>
1886		*Brunner, Sir John Tomlinson, Bart., M.P., <i>Druid's Cross, Wavertree, Liverpool.</i>
1880	<i>c d p</i>	*Burdett, Sir Henry Charles, K.C.B., <i>The Lodge, Porchester-square, W.</i>
1873		*Burdett-Coutts, The Right Hon. the Baroness, <i>1, Stratton-st., W.; and Holly Lodge, Highgate.</i>
1884	<i>d</i>	Burdett-Coutts, William, M.P., <i>1, Stratton-street, Piccadilly, W.</i>
1902		Burgess, James Henry, F.S.A.A., <i>"Wharmon," Swallowbeck, Lincoln.</i>
1897		Burke, David, A.I.A., <i>Royal Victoria Life Ins. Co., P.O. Box 78, Montreal, Canada.</i>
1905		Burns, Thomas Robert, <i>Kingscourt, Wellington-place, Belfast.</i>
1895		Burrup, John Arthur Evans, <i>c/o Messrs. King, Hamilton & Co., Calcutta.</i>
1880		Burt, Frederick, F.R.G.S., <i>Pinewood, Stoke Poges, R.S.O. nr. Slough, Bucks.</i>

Year of Election.		
1901		Burt, George Stephen, 4, <i>Lothbury, E.C.</i>
1872		*Burton, The Right Hon. Lord, <i>Chesterfield House, Mayfair, W.; and Range- more, Burton-on-Trent.</i>
1898		Burton, William, <i>c/o Colonial Mutual Life Association Society, Queenstown, S. Africa.</i>
1893	<i>d</i>	*Bushill, Thomas William, 14, <i>Park-avenue, Soho Hill, Birmingham.</i>
1892		Byworth, Charles Joseph, F.S.A.A., <i>Narford, Lyford-rl., Wandsworth Common. S. W.</i>
1902	<i>d</i>	Caillard, Sir Vincent Henry P., 42, <i>Half Moon-street, W.</i>
1897		Cairnes, Frederick Evelyn, <i>Killester House, Raheny, Co. Dublin.</i>
1903		Caldwell, William, 162, <i>Bath-street, Glasgow.</i>
1896		Campbell, Charles William, C.M.G., <i>H.B.M. Consulate General, Shanghai, China.</i>
1905	<i>d</i>	Campbell, Richardson, "Dunedin," <i>Woodlands-street, Manchester.</i>
1879		Campbell-Colquhoun, Rev. John Erskine, <i>Chartwell, Westerham, Kent.</i>
1889	<i>d p</i>	Cannan, Edwin, M.A., LL.D., 46, <i>Wellington-square, Oxford.</i>
1891	<i>d</i>	Cannon, Henry W. (<i>Chase National Bank</i>), 83, <i>Cedar-street, New York, U.S.A.</i>
1900	<i>d</i>	Canovai, Commendatore Tito, <i>Bank of Italy, Rome.</i>
1872		*Carillon, J. Wilson, F.S.A., F.R.G.S., <i>The Chimes, Richmond, Surrey.</i>
1888		Carr, Ebenezer, 24, <i>Coleman-street, Bank, E.C.</i>
1904		Carrington, John Broyden, 2, <i>Aldridge-road-villas, Paddington, W.</i>

Year of Election.		
1890		*Carter, Eric Mackay, A.I.A., F.C.A., 33, <i>Waterloo-street, Birmingham.</i>
1883	d	*Carter, Joseph Robert, <i>Courtfield, Ross-road, Wallington, Surrey.</i>
1878		*Casley, Reginald Kennedy, M.D., <i>Ipswich.</i>
1881		Causton, Right Hon. Richard Knight, M.P., 12, <i>Devenshire-place, Portland-place, W.</i>
1903		Cawson, Frederick Arthur, 80, <i>Behnmont-road, Liverpool.</i>
1884	d	*Chailley-Bert, Joseph, 44, <i>Chaussée d'Antin, Paris.</i>
1902		Chalmers, Patrick R., 9, <i>Idol-lane, Eastcheap, E.C.</i>
1880		*Chamberlain, The Right Hon. Joseph, M.P., F.R.S., 40, <i>Prince's-gardens, S.W.</i>
1901	d p	Chance, Sir William, Bart., M.A., J.P., <i>Orchards, near Godalming.</i>
1903		Channing, Francis Allston, M.A., M.P., 40, <i>Eaton-place, S.W.</i>
1886	d p	*Chapman, Samuel, 227—228, <i>Gresham House, Old Broad-st., E.C.</i>
1903		Chapman, Professor Sydney John, M.A., <i>Owen's College, Manchester.</i>
1901	d	Chapman, Walter William, 4, <i>Mowbray House, Norfolk-street, Strand.</i>
1904		Charles, Thomas Edwin, 52, <i>Saulbrock-road, Lewisham, S.E.</i>
1892		*Chatham, James, F.I.A., F.F.A., 98, <i>Inverleith-place, Edinburgh.</i>
1901		Cherry, Francis, 45, <i>Lombard-street, E.C.</i>
1903		Chiozza-Money, Leo George, <i>Oatlands Park, Weybridge.</i>
1886	d p	*Chisholm, George Goudie, M.A., B.Sc., F.R.G.S., 59, <i>Drakefield-road, Upper Tooting.</i>
1904		Clark, Archibald Brown, 16, <i>Comely Bank-street, Edinburgh.</i>
1900		Clark, John S., 110, <i>Boylston-street, Boston, Mass., U.S.A.</i>
1901		Clark, William Henry, B.A., C.M.G., 6, <i>Pall Mall, S.W.</i>
1888		Clarke, C. Goddard, J.P., <i>South Lodge, Champion-hill, S.E.</i>
1882	c d	*CLARKE, SIR ERNEST, 13a, <i>Hanover-square, W.</i>
1877		*Clarke, Henry, L.R.C.P., <i>H.M. Prison, Wakefield, Yorks.</i>
1890		Clarke, Henry, J.P., <i>Cannon Hall, Humpstead, N.W.</i>

Year of Election.		
1899		Claughton, Gilbert H., <i>The Priory, Dudley.</i>
1853		Clirehugh, William Palin, F.I.A., 66, <i>Cornhill, E.C.</i>
1893	c d p	COGLAN, TIMOTHY AUGUSTINE, I.S.O., (<i>Agent-General for New South Wales</i>), 9, <i>Victoria-street, S.W.</i>
1905		*Cohen, Charles Waley, M.A., 11, <i>Hyde Park-terrace, W.</i>
1887	c d	COHEN, NATHANIEL LOUIS, 11, <i>Hyde Park-terrace, W.</i>
1859		Coles, John, F.I.A., 39, <i>Throgmorton-street, E.C.</i>
1905		Coles, Richard John, F.C.I.S., <i>Addenbrooke's Hospital, Cambridge.</i>
1892	p	*Collet, Miss Clara Elizabeth, M.A., 43, <i>Parliament-street, S.W.</i>
1895		Collins, Howard James, <i>The General Hospital, Birmingham.</i>
1882		*Collum, Rev. Hugh Robert, M.R.I.A., F.R.C.I., <i>Leigh Vicarage, near Tonbridge, Kent.</i>
1891	d	Cooper, Joseph, 60, <i>Park-street, Farnworth, near Bolton.</i>
1903		Cope, Rev. Robert Goodacre, <i>Hepworth Vicarage, Huddersfield.</i>
1901		Cornish, Henry James, 90, <i>Cambridge-gardens, W.</i>
1889		Cornwallis. Fiennes Stanley Wykeham, <i>Linton-park, Maidstone, Kent.</i>
1899	d	Court, Stephen E., <i>Municipal Offices, P.O. Box 1,049, Johannesburg.</i>
1862	c d p	COURTNEY, THE RIGHT HON. LEONARD HENRY, M.A. (<i>Honorary Vice-President</i>), 15, <i>Cheyne Walk, Chelsea, S.W.</i>
1896	d	Cox, Harold, B.A., 6, <i>Raymond-buildings, Gray's Inn, W.C.</i>
1902		*Coxon, William, 15, <i>Elsworthy-terrace, N.W.</i>
1871	d	Cozens-Smith, Edward, 16, <i>Kensington-square, W.</i>
1888	d	Craggs, Sir John George, M.V.O., F.C.A., <i>Craggs, Turketine & Co., 52, Coleman-st., E.C.</i>
1874	c d p	CRAIGIE, MAJOR PATRICK GEORGE, C.B. (<i>Honorary Vice-President</i>), <i>Board of Agriculture and Fisheries, 3, St. James's-square, S.W.</i>
1902		Craven, Edward Joseph E., <i>Statistical Office, Custom House, E.C.</i>
1890	c d p	CRAWFORD, RICHARD FREDERICK, <i>Custom House, Lower Thames-street, E.C.</i>

Year of
Election.

1891		*Crawley, Charles Edward, <i>Accountant-General, Madras, India.</i>
1894		Crease, Major-General Sir John Frederick, K.C.B., <i>Ince, Guildford.</i>
1878		Crewdson, Ernest, <i>Castle Meadows, Kendal.</i>
1892		Cripps, Charles Alfred, K.C., M.P., <i>1. Essex-court, Temple, E.C.</i>
1890		Croal, David Octavius, <i>Financial News, 11, Abchurch-lane, E.C.</i>
1902		Crosfield, Charles James, J.P., <i>323, Vauxhall-road, Liverpool.</i>
1904		Crotch, William Walter, <i>57, Gracechurch-street, E.C.</i>
1900		Crowley, Michael, F.C.A., F.S.A.A., <i>16, College Green, Dublin</i>
1905		Cruce, Frederick George Landin, <i>27, Chetwynd-road, Southsea.</i>
1883	c d	CUNNINGHAM, REV. WILLIAM, M.A., D.D., <i>2, St. Paul's-road, Cambridge.</i>
1879	d	Curtis, Robert Leabon, F.S.I., J.P., <i>11—12, Finsbury-square, E.C.</i>
1873		Czarnikow, Caesar, <i>29, Mincing-lane, E.C.</i>
1900		Da Costa, José Simao (<i>Garantia da Amazonia</i>), <i>Belem do Para, Brazil.</i>
1900		Dale, Charles Ernest, F.S.A.A., <i>Old Calabar, West Africa.</i>
1886		Dale, Sir David, Bart., <i>West Lodge, Darlington.</i>
1888		Dangerfield, Athelstan, A.C.A., <i>56, Cannon-street, E.C.</i>
1898	d	*Danson, Francis Chatillon, <i>Liverpool and London Chambers, Liverpool.</i>
1901	d	Danvers, Ernest, F.R.G.S., <i>475, B. Mitre, Buenos Ayres.</i>
1880	c d p	Danvers, Frederick Charles, <i>7, Silverdale-road, Eastbourne.</i>

Year of Election.		
1897	<i>d p</i>	*Darwin, Major Leonard, R.E., F.R.G.S., 12, <i>Egerton-place, S.W.</i>
1905		Daugherty, Charles M., <i>c/o American Express Co., 3, Waterloo-pl., S.W.</i>
1901	<i>d</i>	Davar, Sohrab R., M.S.A., 27, <i>Military Square, Fort, Bombay.</i>
1901		Davies, Dixon Henry, <i>Great Central Ry., Marylebone Station, N.W.</i>
1899		D'Avigdor-Goldsmid, Osmond Elim, <i>Somerhill, Tonbridge, Kent.</i>
1888		Dawson, G. J. Crosbie, M. Inst. C.E., F.G.S., <i>May-place, Newcastle, Staffs.</i>
1899		Dawson, Miles Menander, 11, <i>Broadway, New York, U.S.A.</i>
1903	<i>d</i>	Dawson, Sidney Stanley, F.C.A., F.C.I.S., 51, <i>North John-street, Liverpool.</i>
1905		D'Azevedo, Joao Lucio, 7, <i>Calçada do Sacramento, Lisbon.</i>
1897	<i>d</i>	Deane, Albert Bickerton, 35, <i>Great George-street, Westminster, S.W.</i>
1880		Debenham, Frank, 1, <i>Fitzjohn's-avenue, Hampstead, N.W.</i>
1885	<i>d</i>	De Broë, Emile Conrad De Bichin, <i>Walden Lodge, Carlisle-road, Eastbourne.</i>
1879		*De Ferrieres, The Baron Du Bois, <i>Bay's Hill House, Cheltenham.</i>
1898		Defries, Wolf, B.A., 147, <i>Homnedsitch, E.C.</i>
1900	<i>d</i>	De la Plaza, Victorino, LL.D. (<i>Buenos Ayres Ry. Co.</i>), <i>Poste Restante. Buenos Ayres.</i>
1891		Denne, William, <i>Phillimore, Wetherill-road, New Southgate, N.</i>
1873		Dent, Edward, 2, <i>Carlos-place. Grosvenor-square, W.</i>
1887		Dent, George Middlewood, 20, <i>Park-avenue, Southport.</i>
1889		De Rothschild, Leopold, D.L., 5, <i>Hamilton-place, Piccadilly, W.</i>
1892		De Smidt, Henry, C.M.G., <i>The Treasury, Cape Town, Cape Colony.</i>
1892		Dewar, William Nimmo (<i>Standard Life Assurance Co.</i>), 28, <i>Elizabeth-street, Sydney, N.S.W.</i>
1900		Dewsnup, Professor Ernest Ritson, M.A., F.R.G.S., <i>University of Chicago, Mass., U.S.A.,</i>
1903		Digby, William Pollard, <i>Trafalgar-buildings, Charing Cross, W.C.</i>
1866	<i>c d p</i>	*Dilke, The Right Hon. Sir Charles Wentworth, Bart., M.P., LL.M., 76, <i>Sloane-street, S.W.</i>
1897		Dobson, Goland Burton, 58, <i>Lincoln's Inn Fields, W.C.</i>

Year of Election.		
1889		Double, Alfred, C.C., 91, <i>Fore-street, E.C.</i>
1889		Doubleday, William Bennett, 123, <i>Tulse-hill, S.W.</i>
1899	<i>d</i>	Dougharty, Harold, A.I.A., F.C.I.S., <i>Lond. & Launc. Life Office, 66—67, Cornhill, E.C.</i>
1878	<i>d</i>	Doyle, Patrick, C.E., F.G.S., M.R.A.S., <i>Calcutta.</i>
1894	<i>c d p</i>	DRAGE, GEOFFREY, M.A., 20, <i>Loicudes-square, S.W.</i>
1890		Drummond, Charles James, 21, <i>Dalmore-road, West Dulwich, S.E.</i>
1897	<i>d p</i>	Dudfield, Reginald, M.A., M.B., 19, <i>Blomfield-road, Maida Vale, W.</i>
1895	<i>c</i>	Dudley, His Excellency The Earl of, <i>Dublin.</i>
1875	<i>d p</i>	Dun, John, <i>Parr's Bank, Bartholomew-lane, E.C.</i>
1902		Dunbar, Sir William Cospatrick, Bart., C.B., <i>Somerset House, Strand, W.C.</i>
1878	<i>c</i>	*Dunraven, The Right Hon. the Earl of, K.P., C.M.G., <i>Kerry House, Putney Vale, S.W.</i>
1885		Dyer, William John, 17, <i>Montpelier-row, Blackheath, S.E.</i>
1905		Dyke, Arthur James, <i>Secretary's Office, Board of Customs, E.C.</i>
1904		Dymant, Arthur Francis, <i>Great Northern Railway, King's Cross Station.</i>
1888		Earnshaw, Jacob, <i>Prudential Assnce. Bldgs., 78, King-st. Manchester.</i>
1888	<i>d</i>	Eckersley, J. C., M.A., F.R.G.S., <i>Ashfield, Wigan.</i>
1883	<i>c d p</i>	Edgeworth, Professor Francis Ysidro, M.A., D.C.L., 5, <i>Mount Vernon, N.W.; and All Souls', Oxford.</i>
1896		Edwards, Charles Lewis, <i>Great Northern Railway Offices, King's Cross.</i>
1880		Egerton of Tatton, The Right Hon. Earl, 7, <i>St. James's-square, S.W.</i>
1885	<i>c d p</i>	Elliott, Sir Thomas Henry, K.C.B., <i>Board of Agriculture and Fisheries, 4, White-hall-place, S.W.</i>

Year of Election.		
1885		Elliott, William, <i>P.O. Box 42, Lower St. George's-st., Cape Town.</i>
1895		Elliott, William, junr., <i>P.O. Box 1583, Johannesburg, South Africa.</i>
1895		Elwell, William Henry, <i>Howard House, 4, Arundel-street, Strand, W.C.</i>
1903		Enthoven, Reginald Edward, I.C.S., <i>14, Connaught-place, W.</i>
1889	<i>d</i>	Erhardt, William, <i>7, Bury-street, Bloomsbury, W.C.</i>
1905		Erlund, Cécile, <i>Ashcroft, Wadhurst, Sussex.</i>
1896		Everett, Percy Winn, <i>Oaklands, Elstree, Herts.</i>
1892		Faber, Harald, <i>Fiona, Lennard-road, Pease, S.E.</i>
1905		Falk, Oswald Toynbee, B.A., A.I.A., <i>36, Bloomsbury-square, W.C.</i>
1875		Faraday, Frederick J., <i>17, Brazenose-street, Manchester.</i>
1888		Farlow, A. R. King, <i>4, King-street, Cheapside, E.C.</i>
1889	<i>d</i>	Farnworth, Edward James, F.S.A.A. <i>26, Winckley-square, Preston.</i>
1900		Farrer, The Right Hon. Lord, <i>Abinger Hall, Dorking.</i>
1890		Faulks, Joseph Ernest, B.A., F.I.A., <i>187, Fleet-street, E.C.</i>
1893		*Fawcett, Mrs. Millicent Garrett, <i>2, Gower-street, W.C.</i>
1882		Fell, Arthur, M.A., <i>46, Queen Victoria-street, E.C.</i>
1905		Fellowes, Right Hon. Ailwyn E., M.P., <i>Honingham Park, Norwich.</i>
1894		Fellows, Rowland Hill, F.I.A., <i>41, Montrose-avenue, Queen's Park, N.</i>
1893		Fenwick, John Fenwick, <i>Spencer House, Wimbledon-common.</i>
1899		Finch, Henry Hobson, <i>Goff's Hill, Crawley, Sussex.</i>

Year of Election.		
1889		*Finlay, Major Alexander, <i>The Manor House, Little Brickhill, Bletchley.</i>
1884	d	*Finnemore, R. I., J.P., F.R.G.S., 287, <i>Loop-street, Maritzburg, Natal.</i>
1900		Fisher, Professor Irving, Ph.D., <i>Yale University, New Haven, Conn., U.S.A.</i>
1888		Fisher, Sir Walter Newton, F.C.A., 4, <i>Waterloo-street, Birmingham.</i>
1898		Fisk, George William Victor, 142, <i>Holborn-bars, E.C.</i>
1885		*Fitz-Gerald, Lt.-Col. Wm. G., M.A., F.R.Hist.S.,
1900	d	Fleming, Owen, Assoc. R.I.B.A., 3, <i>Warwick House-street, Charing Cross, S. W.</i>
1893	d p	*Flux, Professor Alfred William, M.A., <i>McGill University, Montreal, Canada.</i>
1882		Foley, Patrick James (<i>Pearl Insurance Company</i>), <i>Adelaide-place, London Bridge, E.C.</i>
1889		Foot, Alfred, <i>Hamilton, 14, Friends-road, Croydon.</i>
1898	d	Forster, John Walter, 18, <i>Mountfield-gardens, Tunbridge Wells.</i>
1893		Fortune, David, J.P., 84, <i>Wilson-street, Glasgow</i> ; and 19, <i>Rowallan-gardens, Partick, Glasgow.</i>
1901		Foster, Harry Seymour, D.L., <i>Albert Mansions, 122, Victoria-street, S. W.</i>
1897		Fountain, H., <i>Board of Trade, Whitehall-gardens, S. W.</i>
1899	e p	FOWLER, THE RIGHT HON. SIR HENRY HARTLEY, G.C.S.I., M.P. (<i>Honorary Vice-President</i>), <i>Reform Club, Pall Mall, S. W.</i>
1900	e d p	FOX, ARTHUR WILSON, C.B. (<i>Hon. Secretary</i>). <i>Board of Trade, 7, Whitehall-gardens, S. W.</i>
1903		Fox, Matthew Joseph, <i>c/o The National Mutual Life Office, Melbourne.</i>
1878	c d	Foxwell, Professor H. Somerton, M.A., <i>St. John's College, Cambridge.</i>
1894		Francis, Joseph, 10, <i>Finsbury-square, E.C.</i>
1887		Frankland, Frederick William, F.I.A., <i>Herston, Foxton, Manawata, N. Zealand.</i>
1899		Franklin, Arthur Ellis, 29, <i>Pembroke-gardens, Bayswater, W.</i>
1903		Fraser, Malcolm Alexander Clement, <i>Government Statistician, Perth, W. Australia.</i>
1886	d	Fream, Professor William, B.Sc., LL.D., <i>The Vinery, Downton, Salisbury.</i>
1887		Freeman, T. Kyffin, F.G.S., 35, <i>Whitehall-park, N.</i>

Year of Election.		
1890		Freestone, John, 15, <i>Beckingham-road, Leicester.</i>
1902		Fremantle, Professor Henry Eardley Stephen, <i>University of South Africa, Cape Town.</i>
1905		Frings, Francis A., 59, <i>Bishopsgate-street Within, E.C.</i>
1903	d	Fry, Thomas Hallett, 2, <i>Cloisters, Temple, E.C.; and Amersham House, Beckenham.</i>
1886		Fuller, George Pargiter, <i>Neston-park, Corsham, Wilts.</i>
1878		Fuller, William Palmer, 2, <i>Verulam-buildings, Gray's Inn, W.C.</i>
1902		Gait, Edward Albert, I.C.S., <i>Writers-buildings, Calcutta.</i>
1852		Galsworthy, Sir Edwin Henry, J.P., 26, <i>Sussex-place, Regent's-park, N.W.</i>
1860	c d p	Galton, Francis, F.R.S., D.C.L., D.Sc., 42, <i>Rutland-gate, S.W.</i>
1887	d	Garcke, Emile, <i>Donington House, Norfolk-street, Strand, W.C.</i>
1904		*Gates, Chasemore Philip, <i>The Reed Cottage, Soham, Cambs.</i>
1880		*Gates, John Benjamin, A.C.A., 47, <i>Warwick-street, Regent-street, W.</i>
1899		Gelling, Benjamin Richard, <i>Mutual Life Assn. of Australasia, Sydney, N.S.W.</i>
1885		Gibb, Sir George S., <i>North-Eastern Railway Company, York.</i>
1889	d	Gibson, George Rutledge, <i>Tuxedo Park, New York, U.S.A.</i>
1867	c d p	*GIFFEN, SIR ROBERT, K.C.B., LL.D., F.R.S. (<i>Honorary Vice-President</i>), <i>Chanctonbury, Hayward's Heath.</i>
1877		Gilbert, William H. Sainsbury, 70, <i>Queen-street, Cheapside, E.C.</i>
1900		Gladwell, Sydney William, 59, <i>Palace-street, Victoria-street, S.W.</i>

Year of Election.		
1878		*Glanville, Silvanus Goring, <i>Lloyds, Royal Exchange, E.C.</i>
1860	c p	GLOVER, SIR JOHN, J.P., 88, <i>Bishopsgate-street Within, E.C.</i>
1888		Goad, Charles E., M. Am. and Can. Soc. C.E., 53, <i>New Broad-st., E.C.; and Montreal, Canada.</i>
1901		Godfrey, Ernest Henry, <i>Woodford, Clarence-road, Harpenden.</i>
1903		Goldman, Leopold, A.I.A., F.C.A., 112—118, <i>King-street West, Toronto.</i>
1897	c d p	Gomme, George Laurence, F.S.A., 24, <i>Dorset-square, Marylebone, N.W.</i>
1884	d	*Gonner, Professor Edward C. K., M.A., <i>University College, Liverpool.</i>
1901		*Gooch, Henry Cubitt, 17, <i>Oxford-square, W.</i>
1885		Goodsall, David Henry, F.R.C.S., 17, <i>Devonshire-place, W.</i>
1900	d	Goodsir, George (<i>Weidell & Co.</i>), 16, <i>St. Helen's-place, E.C.</i>
1892		Goodwin, Alfred, M.A., 2, <i>Charles-road, St. Leonards, Sussex.</i>
1899		Gordon, Charles H. F., <i>Dumtoun, Churt-Wynde, Hindhead.</i>
1868	c d p	GOSCHEN, RIGHT HON. VISCOUNT, F.R.S. (<i>Honorary Vice-President</i>), <i>Seacroft Heath, Hawkhurst, Kent.</i>
1899	d	Gouge, Herbert Dillon, <i>Public Actuary, Adelaide, S.A.</i>
1887		Gover, Frederic Field, 10, <i>Lee-park, Blackheath, S.E.</i>
1893		*Gray, The Hon. James McLaren, M.A., F.R.G.S., <i>c/o R. Todd, 1, York-buildings, Adelphi, W.C.</i>
1904		*Gray, Robert Kaye, 106, <i>Cannon-street, E.C.</i>
1895	d	Green, John Little, <i>Laugholm, Embleton-road, Lewisham, S.E.</i>
1902		Green, Walford Davis, M.A., M.P., <i>High Garth, Balcombe, Sussex.</i>
1895		Gretton, John, M.P., <i>Stapleford Park, Melton-Mowbray.</i>
1887		Gribble, George J., <i>Henham Grange, Biggleswade.</i>
1868		Griffith, Edward Clifton, <i>Reliance Office, 71, King William-street, E.C.</i>
1903		Groves, Joseph, M.D., M.B., M.O.H., <i>Carisbrooke, Isle of Wight.</i>
1905		Gubbay, M. M. Simeon, B.A., <i>Custom House, Bombay.</i>
1878		Guthrie, Charles, F.C.A., <i>c/o London Bank of Australia, Melbourne.</i>

Year of Election.		
1887	<i>d p</i>	Guyot, Yves, 95, <i>Rue de Seine, Paris.</i>
1880		*Gwynne, James Eglinton A., J.P., F.S.A., <i>Folkington Manor, Polegate, Sussex.</i>
1887		Gwyther, John Howard, 13, <i>Lancaster-gate, W.</i>
1892	<i>d</i>	Hadfield, Robert A., <i>Parkhead House, Sheffield.</i>
1873	<i>d</i>	*Haggard, Frederick T., 1, <i>Broadwater Down, Tunbridge Wells.</i>
1904		Haig, C. R., <i>The Nest, Chelmsford.</i>
1903		*Haig, Edric Wolseley, M.A., LL.M., <i>Gatehampton, Goring, Oxon.</i>
1887		Haldeman, Donald Carmichael, <i>Mutual Life Insurance Co. of New York,</i> 17 & 18, <i>Cornhill, E.C.</i>
1883		Hall, Sir John, K.C.M.G., <i>Hororata, Canterbury, New Zealand.</i>
1897	<i>d</i>	Hall, Thomas, <i>Railway Commissioners' Offices, Sydney, N.S.W.</i>
1878		Hallett, Thomas George Palmer, M.A., <i>Claverton Lodge, Bath.</i>
1903		Hamilton, Charles Joseph, B.A., 88, <i>Tryford-avenue, W. Acton, W.</i>
1887	<i>d</i>	Hamilton, Sir Edward W., K.C.B., I.S.O., <i>The Treasury, Whitehall, S.W.</i>
1873	<i>c d p</i>	HAMILTON, THE RIGHT HON. LORD GEORGE FRANCIS, G.C.S.I., M.P. (<i>Vice-President</i>), 17, <i>Montagu-street, Portman-square, W.</i>
1884		*Hammersley, Hugh Greenwood, <i>The Grove, Hampstead, N.W.</i>
1885		*Hancock, Charles, M.A., 2, <i>Cloisters, Temple, E.C.; and Reform Club, S.W.</i>
1875		Hankey, Ernest Alers, <i>Notton, Lacock, Chippenham.</i>
1876		Hansard, Luke, 68, <i>Lombard-street, E.C.</i>
1886		*Hardcastle, Basil William, 12, <i>Gainsborough-gardens, Hampstead, N.W.</i>

Year of Election.		
1883		Harding, G. P., <i>Golfers' Club, Whitehall-court, S.W.</i>
1900		Hardingham, Frederick Robert, <i>26, East-parade, Leeds.</i>
1902		Hardy, Arthur Johnston, <i>52, Lower Sackville-street, Dublin.</i>
1884		Hardy, George Francis, F.I.A., <i>7, Broad Street House, E.C.</i>
1903		Harper, Augustus Yeo.
1901	d p	Harper, Edgar Josiah, <i>County Hall, Spring-gardens, S.W.</i>
1893		Harrap, Thomas, <i>143, Stamford-street, Ashton-under-Lyne, Lancs</i>
1868		Harris, David, <i>Lyncombe Rise, Prior Park-road, Bath.</i>
1899		Harris, Frank Drew, M.B. (Lond.), D.P.H.,
1901		Harris, Frederic Ernest, <i>Met. Water Bld., Carlton Hall, Westminster, S.W.</i>
1897		Harris, Walter Fred., F.I.C.A., <i>16, Parliament-street, Hull.</i>
1887		Harris, William A., F.R.S.S.A., <i>Phoenix Chambers, Exchange, Liverpool.</i>
1882	p	Harris, William James, <i>Halwill Manor, Beaworthy, N. Devon.</i>
1902		Hart, Francis John Henning, <i>301, Pitt-street, Sydney, N.S.W.</i>
1900	p	Hartley, Edwin Leach, B.A., <i>1, Paper-buildings, Temple, E.C.</i>
1899		Harvey, Baldwin S., <i>67, Lombard-street, E.C.</i>
1896		Hawkins, Willoughby R., <i>Bute Docks, Cardiff.</i>
1897		Hayakawa, S., <i>69, Nagatacho-Nichome, Tokio, Japan.</i>
1895	d	Haynes, Thomas Henry, <i>1, Endsleigh-terrace, Tavistock.</i>
1898	d p	Hayward, Thomas Ernest, M.B. (Lond.), F.R.C.S., <i>Clipsley Lodge, Haydock, near St. Helens.</i>
1896		*Heaton-Armstrong, William Charles, J.P., <i>30, Portland-place, W.</i>
1889		*Hemming, Arthur George, F.I.A. (London Ass. Corporation), 7, Royal Exchange, E.C.
1855	c d p	*HENDRIKS, FREDERICK, F.I.A. (Vice-President), <i>7, Vicarage-gate, Kensington, W.</i>
1898		Herring, George, <i>1, Hamilton-place, Piccadilly, W.</i>
1890	d	Hewins, Professor W. A. S., M.A., <i>The Rowans, Putney Lower Common, S.W.</i>

Year of Election		
1886		Hibbert, Sir Henry F., 8, <i>Park-road, Chorley, Lancashire.</i>
1892	<i>c d p</i>	*Higgs, Henry, LL.B., <i>The Treasury, Whitehall, S. W.</i>
1878		*Hill, Frederick Morley, 22, <i>Richmond-road, Barnsbury, N.</i>
1904		Hill, William Edward, <i>Windsor-place, Shrewsbury.</i>
1900		Hillingdon, The Right Hon. Lord, 67, <i>Lombard-street, E. C.</i>
1903		Hiscock, Elias John, 51, <i>Sotheby-road, Highbury, N.</i>
1904		Hobson, John Atkinson, <i>Elmstead, Limpsfield, Surrey.</i>
1905		Hodge, James Philp, A.C.A., 4, <i>Godstall Chambers, Eastgate-row, Chester.</i>
1897	<i>d</i>	Hodgson, William Gill, F.S.A.A., <i>Banford, viâ Sheffield.</i>
1888		Hollams, Sir John, 52, <i>Eaton-square, S. W.</i>
1895		Holland, Hon. Lionel Raleigh, B.A., 75, <i>Eaton-square, S. W.</i>
1898		Holland, Robert Martin, 68, <i>Lombard-street, E. C.</i>
1894	<i>d p</i>	Hollerith, Herman, Ph.D., &c., 1054, <i>31st-street, Washington, D. C., U. S. A.</i>
1900		Holliday, John, M.A., F.I.A. (<i>Rio City Improvement Co.</i>), 403, <i>Caixa do Correio, Rio de Janeiro.</i>
1901		Holmes, Richard Henry, J.P. (Alderman), 10, <i>Royal Arcade, Newcastle-on-Tyne.</i>
1891	<i>d</i>	Hooker, Sir Joseph Dalton, G.C.S.I., F.R.S., &c., <i>The Camp, Sunningdale.</i>
1895	<i>d p</i>	*Hooker, Reginald Hawthorn, M.A., <i>Royal Gardens, Kew.</i>
1896		Hooper, Angus W., <i>Montreal, Canada.</i>
1904		Hooper, Frederick Tungate, 77—79, <i>New Briggate, Leeds.</i>
1879		Hooper, George Norgate, <i>Elmleigh, Hayne-road, Beckenham, Kent.</i>
1903	<i>d</i>	Hooper, William George, 111, <i>Musters-road, West Bridgford, Nottingham.</i>
1878	<i>c d p</i>	Hooper, Wymard, 13, <i>Summer-place, Ouslow-square, S. W.</i>
1887		Hopkins, John, <i>Little Bouldes, Southborough, Kent.</i>
1899		Hopkins, John Castell, 90, <i>Wellington-street West, Toronto.</i>
1902		Hopwood, Sir Francis John Stephen, K.C.B., C.M.G., <i>Board of Trade, Whitehall-gardens, S. W.</i>

Year of Election.		
1894		Houldsworth, Sir William H., Bart., M.P., 35, <i>Grosvenor-place, S. W.</i>
1883		Howell, Francis Buller, <i>Ethy, Lostwithiel, Cornwall.</i>
1897	<i>p</i>	Howell, Price, <i>Lindfield, near Sydney, N.S. W.</i>
1874	<i>c d p</i>	HUMPHREYS, NOEL ALGERNON, I.S.O., <i>Ravenhurst, Hook-road, Surbiton.</i>
1903		Hunt, Arthur Leonard, <i>WestHeath Mount, Hermitage-lane, Hampstead, N.</i>
1883		Hunt, Richard Aldington, A.I.A., (<i>Wesleyan and General Assurance Society</i>), <i>Steelhouse-lane, Birmingham.</i>
1903		Hunter, Arthur, 346, <i>Broadway, New York, U.S.A.</i>
1888		Hunter, George Burton, <i>Wallsend-on-Tyne.</i>
1902	<i>p</i>	Hutchins, Miss Bessie Leigh, <i>The Glade, Branch-hill, Hampstead-heath, N.W.</i>
1888		Hyde, Clarendon G., 75, <i>Gloucester-terrace, Hyde-park, W.</i>
1887		Hyde, Henry Barry, 5, <i>Eaton-rise, Ealing, W.</i>
1901		Hyde, Hugh Vivian, <i>Board of Agriculture and Fisheries, 3, St. James's-square, S. W.</i>
1893	<i>d</i>	Hyde, Hon. John, 1458, <i>Euclid-place, Washington, D.C., U.S.A.</i>
1874	<i>d p</i>	*Ingall, William Thomas Fitzherbert Mackenzie, <i>Invermark, Limpsfield, Surrey.</i>
1869		*Inglis, Cornelius, M.D., <i>Athenaeum Club, S. W.</i>
1903		Innes, Alfred Mitchell, <i>Under Sec. of State for Finance, Cairo, Egypt.</i>
1901	<i>d</i>	Ireland, Alleyne (c/o Dr. Edward E. Thorpe), 711, <i>Boylston-street, Boston, Mass., U.S.A.</i>
1887		Irvine, Somerset William D'Arcy, J.P., <i>Equitable Life Office of United States, Sydney, N.S. W.</i>

Year of
Election.
1864

*Ivey, George Pearse,
7, *The Drive, Hove.*

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| 1903 | | Jack, Robert Robertson,
<i>Molesworth-street, Lismore, N.S. W.</i> |
| 1902 | <i>d</i> | Jagger, John William,
<i>Cape Town.</i> |
| 1894 | <i>d</i> | Jamieson, George, C.M.G.,
<i>The Thatched House Club, St. James's-st., S. W.</i> |
| 1872 | <i>c d p</i> | Janson, Frederick Halsey, F.L.S.,
<i>S, Fourth-avenue, Hove.</i> |
| 1897 | <i>d</i> | Jay, E. Aubrey Hastings,
<i>Tower House, Woolwich.</i> |
| 1896 | <i>d</i> | Jemey, Charles Albert,
<i>58, William-street, New York.</i> |
| 1881 | | *Jersey, The Right Hon. the Earl of, G.C.B.,
<i>Osterley-park, Isleworth.</i> |
| 1881 | | Johnson, Edwin Eltham,
<i>110, Cannon-street, E. C.</i> |
| 1891 | <i>d</i> | Johnson, George,
<i>28, Locket-road, Wealdstone.</i> |
| 1878 | <i>d</i> | Johnstone, Edward,
<i>Queensbury, South-road, Clapham-park, S. W.</i> |
| 1900 | | Jones, A. S. J. Warren,
<i>B.B. and C.I. Railway, Fort, Bombay.</i> |
| 1905 | | Jones, John Henry,
<i>306, Neath-road, Landore, Swansea.</i> |
| 1877 | | Jones, Theodore Brooke,
<i>70, Gracechurch-street, E. C.</i> |
| 1888 | <i>d</i> | *Jordan, William Leighton,
<i>Thatched House Club, St. James's-street, S. W.</i> |
| 1889 | | Justican, Edwin, F.I.A.,
<i>St. Mildred's House, Poultry, E. C.</i> |

Year of Election.		
1902		Kains-Jackson, Charles Philip Castle, 18, <i>The Green, Richmond.</i>
1885		Keen, William Brock, 3, <i>Church-court, Old Jewry, E.C.</i>
1884		Kelly, Edward Festus, 182—184, <i>High Holborn, W.C.</i>
1883	<i>c d</i>	Keltie, John Scott, F.R.G.S., LL.D., 15, <i>Neville-court, Abbey-road, N.W.</i>
1884	<i>d</i>	Kemp, John, 46, <i>Cannon-street, E.C.</i>
1884	<i>c d</i>	*Kennedy, Sir Charles Malcolm. K.C.M.G., C.B., 4, <i>Lonisa-terrace, Esmouth, South Devon.</i>
1878		Kennedy, J. Murray, <i>New University Club, St. James's-street, S.W.</i>
1901		*Kennedy, Pitt, 14, <i>Pembridge-place, W.</i>
1898		Kent, Arthur C., 47, <i>Buckingham Palace-road, S.W.</i>
1899		Kershaw, John Baker C., F.I.C., <i>West Lancs. Laboratory, Waterloo, Liverpool.</i>
1905		Keshishian, Agazar, 122, <i>Churchill-road, Willesden-green, N.W.</i>
1883	<i>d</i>	*Keynes, John Neville, M.A., D.Sc., 6, <i>Harvey-road, Cambridge.</i>
1905		Keyworth, William, 32, <i>Bridlesmith-gate, Nottingham.</i>
1884		Kimber, Sir Henry, Bart., M.P., 79, <i>Lombard-street, E.C.</i>
1898	<i>c d</i>	*KING, ARTHUR WILLIAM WATERLOW, <i>Orchard House, Gt. Smith-st., Westminster, S.W.</i>
1883	<i>p</i>	*King, Bolton, M.A., <i>Arlen Lodge, Warwick.</i>
1894		*Kirkcaldy, William Melville, <i>Dunedin, Otago, New Zealand.</i>
1888		*Kitson, Sir James, Bart., M.P., J.P., <i>Gledhow Hall, Leeds.</i>
1889		Kloetgen, W. J. H., 34, <i>Gutter-lane, Cheapside, E.C.</i>
1899	<i>d</i>	Knight, John Martin, <i>Chislehurst, Wanstead Pk.-av., Wanstead Park, E.</i>
1878		*Kusaka, Yoshio, <i>First National Bank, Tokio, Japan.</i>

Year of Election.		
1902	<i>d</i>	Labitte, Emilio. <i>Departimento de Agricultura, Casa de Gobierno, Buenos Aires.</i>
1901		Lakin-Smith, Herbert, <i>26, Waterloo-street, Birmingham.</i>
1903		Lance, Charles Carey. <i>c/o F. S. Willis, Stock Exchange Bldgs., Pitt-st., Sydney, N.S.W.</i>
1898		Lander, Mrs. Beatrice, B.Sc., <i>108, Rouge Bouillon, St. Helier, Jersey.</i>
1902		Lark, Albert Ernest, F.C.A., <i>2, South Quay, Great Yarmouth.</i>
1885	<i>d</i>	Latham, Baldwin, M.Inst. C.E., <i>Parliament-mansions, Victoria-street, S.W.</i>
1897	<i>d</i>	*Lawrence, Frederick William, M.A., <i>Mansfield House, Canning Town, E.</i>
1904		Lawson, Rev. Herbert J., <i>The Lawn, Diss, Norfolk.</i>
1890	<i>d</i>	Lawson, William Ramage, <i>Finchley Lodge, North Finchley, N.</i>
1883	<i>d</i>	*Leadam, Isaac Saunders, M.A., <i>1, The Cloisters, Temple, E.C.; and Reform Club, S.W.</i>
1905	<i>d</i>	*Leake, Percy Dewe, <i>25, Abchurch-lane, E.C.</i>
1899		Lee, Arthur, <i>37, Woodville-gardens, Ealing, W.</i>
1879		*Leete, Joseph, <i>36, St. Mary-at-hill, E.C.; and Eversden, S. Norwood-park.</i>
1899		L'Estrange, Charles James (<i>Blackie and Son, Ltd.</i>), <i>17, Stanhope-street, Glasgow.</i>
1887		Leitch, Alexander (<i>Scottish Provident Institution</i>), <i>17, King William-street, E.C.</i>
1892		Leon, Herbert Samuel, <i>Bletchley-park, Bletchley, Bucks.</i>
1905		Leonhardt, F. von, <i>120, Bishopsgate-street Within, E.C.</i>
1888		*Le Poer-Trench, Col. The Hon. W., R.E., J.P., <i>3, Hyde Park-gardens, W.</i>
1887		*Le Roy-Lewis, Lieut.-Colonel Herman, B.A., D.S.O., <i>Westbury House, Petersfield, Hants.</i>
1898		Leveaux, Arthur Michael, A.I.A., <i>28, Abingdon-street, Westminster, S.W.</i>
1903	<i>d</i>	Levy, Dr. Hermann, <i>Ranchstrasse, 17, Berlin, W. 10.</i>
1862		Lewis, Robert, <i>1, Bartholomew-lane, E.C.</i>
1888		*Liberty, A. Lasenby, <i>The Manor House, The Lee, near Gt. Missenden.</i>

Year of
Election.

1884		*Lines, William Edward, <i>c/o Rev. H. Lines, Golant Vicarage, Par Station, Cornwall.</i>
1902		Litchfield, Frederick, <i>58, Broadfield-road, Catford, S.E.</i>
1898		Litkie, Valerian A., <i>39, South-street, W.</i>
1892		Llewelyn, Sir John T. D., Bart., <i>Penllergare, Swansea.</i>
1903		Lloyd, Godfrey Isaac Howard, <i>The University, Sheffield.</i>
1879		Lloyd, Wilson, J.P., F.R.G.S., <i>Park Lane House, Wood-green, Wednesbury.</i>
1888	<i>c d p</i>	Loch, Charles S., B.A. <i>Drylaw Hatch, Oxshott, Leatherhead.</i>
1882	<i>c d p</i>	*Longstaff, George Blundell, M.A., M.D., F.R.C.P., <i>Highlands, Putney Heath, S.W.</i>
1876		*Lornie, John Guthrie, J.P. (of Birnam & Pitcastle), <i>Rosemount, Kirkcaldy, N.B.</i>
1892	<i>d</i>	Lough, Thomas, M.P., <i>14, Dean's-yard, Westminster, S.W.</i>
1886		*Low, Malcolm, <i>22, Roland-gardens, S.W.</i>
1895		Lowe, Thomas Enoch, F.S.A.A., <i>89, Darlington-street, Wolverhampton.</i>
1905		Loyd, Archie Kirkman, K.C., M.P., <i>Down House, East Hendred, Berks.</i>
1903		Lunge, Ernest, LL.D., <i>18, Southampton-mansions, Southampton-row, W.C.</i>
1904		Luterveld, Willem Margriet Johan van, <i>Schiedamsche Singel, Rotterdam, Holland.</i>
1905		Lynch, William Henry, <i>24, Hendon-lane, Finchley, N.</i>
1875		*Mabson, Richard Rous, <i>"Statist" Office, 51, Cannon-street, E.C.</i>
1894		Macaulay, Thomas Bassett, <i>Sun Life Assurance Co., Montreal, Canada.</i>
1888		McCankie, James, <i>63, George-street, Edinburgh.</i>

Year of Election.		
1903		MacConochie, William Pitt, <i>Glengariff, New Barnet.</i>
1902		Macdonald, John Hutcheson, <i>5, London Wall Bldgs., Finsbury-circus, E.C.</i>
1897		MacDonald, Mrs. Margaret Ethel, <i>3, Lincoln's Inn Fields, W.C.</i>
1898		*Macdonald, Robert Alexander, <i>Royal Bank of Scotland, Edinburgh.</i>
1872	c d p	Macdonell, Sir John, C.B., LL.D., <i>Room 183, The Royal Courts of Justice, W.C.</i>
1873		*McEwen, Laurence T., <i>c/o. R. A. McLean, 1, Queen Victoria-st., E.C.</i>
1905		Macgregor, D. H., M.A., <i>Trinity College, Cambridge.</i>
1899	d	McHardy, Coghlan McLean, J.P., <i>1, Grenville-place, Cromwell-road, S.W.</i>
1900	c	Mackay, Thomas, <i>14, Wetherby-place, S.W.</i>
1886		*Mackenzie, Cohn, F.R.G.S.,
1878		McKewan, William, <i>Elmfield, Bickley, Kent.</i>
1876		*McLean, Robert Allan, F.R.G.S., <i>1, Queen Victoria-street, E.C.</i>
1888	a	McNiel, Henry, <i>18, Exchange-street, Manchester.</i>
1882		MacRosty, Alexander, <i>West Bank, Esher.</i>
1904		Macrosty, Henry William, B.A., <i>29, Hervey-road, Blackheath, S.E.</i>
1899		*MacWharrie, Niel Matheson, <i>Conservative Club, St. James's, S.W.</i>
1891		Maidment, Thomas, <i>Insurance Chambers, King's-road, Southsea.</i>
1904	c	MALLET, BERNARD, <i>38, Rutland-gate, S.W.</i>
1902	d	Mandello, Julius George, Ph.D. <i>I. Tabor u. 2, Budapest.</i>
1902		Mansfield, The Right Hon. the Earl of, <i>Scone Palace, Perth, N.B.</i>
1884		*Manson, Frederick William, <i>Faircrouch, Wadhurst, Sussex.</i>
1888		Manuel, James, <i>36, Vittoria-street, Ottawa, Canada.</i>
1880	c d p	*Marshall, Professor Alfred, M.A., <i>Balliol Croft, Madingley-road, Cambridge.</i>
1887		Marshall, W. Bayley, M.Inst.C.E., M.Inst.M.E., <i>Struan, Richmond Hall, Edgbaston, Birmingham.</i>
1887		Martin, James, <i>4, King-street, Cheapside, E.C.</i>

Year of Election.		
1899		Martin, John Roxburgh, <i>St. Stephen's-av., Parnell, Auckland, N. Zealand.</i>
1872	<i>c d p</i>	*MARTIN, SIR RICHARD BIDDULPH, BART., M.P. (<i>Treasurer and Vice-President</i>), <i>Overbury-court, Tewkesbury, and 68, Lombard-street, E.C.</i>
1884		Mason, William Arthur, <i>31a, Colmore-row, Birmingham.</i>
1898		Massingberd, Stephen, B.A., <i>Gunby Hall, Burgh, Lincolnshire.</i>
1875		*Mathers, John Shackleton,
1903		Mayer, Dr. Clemens, <i>27, Potsdamerstrasse, Berlin, W. 35.</i>
1901		Meakin, George Healey, A.S.A.A., <i>Town Hall, Islington, N.</i>
1882		Medhurst, John Thomas, F.S.A.A., <i>City of London College, White-street, Moorfields, E.C.</i>
1901		Meredith, Hugh Owen, <i>39, Fellows-road, Hampstead, N. W.</i>
1884	<i>d</i>	Merton, Zachary, <i>6, Green-street, Park-lane, W.</i>
1900		Miller, John W., <i>Union Club, S. W.</i>
1889		*Mills, Major Henry Farnsby,
1892	<i>c d</i>	Milner, His Excellency Viscount, G.C.B., G.C.M.G..
1882	<i>p</i>	Milnes, Alfred, M.A., <i>44, Goldhurst-terrace, S. Hampstead, N. W.</i>
1902		Molesworth, Sir Guilford Lindsey, K.C.I.E., <i>The Manor House, Beoley, Kent.</i>
1888	<i>d</i>	*Molloy, William R. J., M.R.I.A. (<i>National Education Board</i>), <i>78, Kenilworth-square, Rathgar, Dublin.</i>
1899		*Moon, Edward Robert Pacy, M.P., <i>6, Onslow Gardens, W.</i>
1887		Moore, Arthur Chisholm, <i>23, Essex-street, Strand, W.C.</i>
1874		Moore, Charles Rendall, <i>43, Breakspears-road, St. Johns, S.E.</i>
1878		*Moore, John Byers Gunning, <i>Loymount, Cookstown, Ireland.</i>
1903		Moores, George, <i>6, Carter-terrace, Greenheys, Manchester.</i>
1902		Morgan, George Frederick Hughes, <i>66, Grafton-road, Acton.</i>
1893	<i>d</i>	Morgan, Percy Charlton, <i>Queen Anne's Chambers, S. W.</i>

Year of Election.		
1902	p	Morison, Theodore, M.A., <i>The Savile Club, 107, Piccadilly, W.</i>
1899		Morris, Thomas Morgan, <i>12, Green-street, Neath, South Wales.</i>
1891	c d p	Morrison, Rev. William Douglas, LL.D., <i>2, Embankment-gardens, Chelsea, S.W.</i>
1904		Mosely, Alfred, C.M.G., <i>West Lodge, Hadley Wood, Barnet.</i>
1885		*Mosley, Tonman, <i>Bangors, Iwer, Uxbridge.</i>
1886	c	Mowbray, Sir Robert Gray Cornish, Bart., M.P., <i>10, Little Stanhope-street, Mayfair, W.</i>
1886	d	Moxon, Thomas B., <i>Lancs. and Yorks. Bank, King-st., Manchester.</i>
1904		Mudie-Smith, Richard, <i>43, Lauderdale-mansions, Maiden Vale, W.</i>
1883		Muirhead, Henry James, <i>Fairfield, Hythe, Kent; and Reform Club, S.W.</i>
1899	d	Muirhead, James Muirhead Potter, <i>Box 1161, 57, St. George's-street, Cape Town.</i>
1899		Mukerji, Benoy Vehari, B.A., B.Litt., <i>Municipal Board, Mainpuri, U.P., India.</i>
1905		Muller, Osvald Valdemar, M.A., <i>Elphinstone College, Bombay; and Newquay, Cornwall.</i>
1891	d	Murphy, Sir Shirley Foster, M.R.C.S., <i>9, Bentinck-terrace, Regent's-park, N.W.</i>
1878	d	Murray, Adam, <i>Hazeldean, Kersal, Manchester.</i>
1878		*Nathan, Henry,
1869	c d p	NEISON, FRANCIS GUSTAVUS PAULUS, F.I.A., <i>93, Adelaide-road, South Hampstead, N.W.</i>
1877		Nevill, Charles Henry, <i>1 and 2, Great Winchester-street, E.C.</i>
1905		Nevill, Henry Rivers, <i>Allahabad, U.P., India.</i>
1900		Newcomb, Harry T., LL.M., <i>Room 700, Bond-bldg., Washington, D.C., U.S.A.</i>
1894		Newey, William Lewis, <i>53, Waverley-road, Small Heath, Birmingham.</i>

Year of Election.		
1889	<i>d p</i>	Newsholme, Arthur, M.D., 11, <i>Gloucester-place, Brighton.</i>
1895	<i>c</i>	*Nicholson, Charles Norris, 35, <i>Harrington-gardens, South Kensington, S. W.</i>
1878	<i>d p</i>	Nicholson, Professor J. Shield, M.A., D.Sc., <i>University of Edinburgh.</i>
1858	<i>d</i>	Nightingale, Miss Florence, 10, <i>South-street, Park-lane, W.</i>
1871		*Noble, Benjamin, F.R.A.S., <i>Westmorland House, Low Fell, Gateshead.</i>
1902		Norman, Frederick Charles (<i>Irish Provident Ass. Co.</i>), <i>The Laurels, Carlton-lane, Derwent-road, Liverpool.</i>
1889		Northampton, The Most Hon. the Marquess of. 51, <i>Lennox-gardens, S. W.</i>
1888		Oakley, Sir Henry, 37, <i>Chester-terrace, Regent's-park, N. W.</i>
1893		O'Connor, Vincent C. Scott, <i>Authors' Club, 3, Whitehall-court; and c/o W. Watson & Co., 7, Waterloo-place, S. W.</i>
1886	<i>d</i>	O'Connor, James Edward, C.I.E., 144, <i>Church-road, Upper Norwood, S. E.</i>
1880		*Oelsner, Isidor, 31, <i>Holland Villas-road, Kensington, W.</i>
1901		Offen, Charles Rose Witcher, <i>Bloomsbury House, Queen-square, W. C.</i>
1885	<i>c d p</i>	Ogle, William, M.A., M.D., F.R.C.P., &c., 10, <i>Gordon-street, Gordon-square, W. C.</i>
1885	<i>d</i>	*Oldham, John (<i>River Plate Telegraph Co.</i>), 287, <i>San Martin, Buenos Aires.</i>
1905		Olivier, P. M., 4, <i>Rue du Parlement, Brussels.</i>
1904		Olmsted, Victor H., <i>The Plymouth, Washington, D. C., U.S.A.</i>
1896		Olney, George Washington, LL.B., 58, <i>William-street, New York City, U.S.A.</i>
1892	<i>c</i>	ONslow, THE RIGHT HON. THE EARL OF, G.C.M.G. (<i>President</i>), <i>Clandon-park, Guildford, Surrey.</i>
1878		Oppenheim, Henry, 16, <i>Bruton-street, Bond-street, W.</i>

Year of Election.		
1899		Ormsby, John Yeaden, <i>c/o Burnett, Ormsby Clapp & Co., 7, Melinda-street, Toronto.</i>
1894	<i>d</i>	Owen, Edgar Theodore, <i>Registrar of Friendly Societies, Perth, W.A.</i>
1887	<i>d</i>	Owen, Evan Frederick, A.I.A., <i>Actuary for Friendly Societies, Melbourne.</i>
1887	<i>d</i>	*Page, Edward D. (<i>Faulkner, Page, & Co.</i>), 60, <i>Worth-street, New York City.</i>
1899	<i>d</i>	Paish, George, "Statist" Office, 51, <i>Cannon-street, E.C.</i>
1866	<i>c d p</i>	*Palgrave, Robert Harry Inglis, F.R.S., <i>Belton, Great Yarmouth, Norfolk.</i>
1888		Pannell, William Henry, F.C.A., <i>Library Chambers, Basinghall-street, E.C.</i>
1901		Parisot, Oscar La Valette, "Daisycroft," <i>Caterham, Surrey.</i>
1878		Park, David Francis, C.A., F.F.A., A.I.A., 39, <i>Lombard-street, E.C.</i>
1903		Parker, Sir Gilbert, M.P., 20, <i>Carlton House-terrace, S.W.</i>
1883		Paterson, John, 1, <i>Walbrook, E.C.</i>
1888		Pattullo, James Durie, 65, <i>London Wall, E.C.</i>
1877		Paul, Henry Moncreiff, 12, <i>Lansdowne-crescent, Notting-hill, W.</i>
1878	<i>d</i>	Paulin, David, 6, <i>Forres-street, Edinburgh.</i>
1893	<i>d</i>	Payne, Alexander William, F.C.A., 70, <i>Finsbury-parcment, E.C.</i>
1884		*Peace, Sir Walter, K.C.M.G., L.S.O., 83, <i>Victoria-street, Westminster, S.W.</i>
1895		Peixotto, M. Percy (<i>U.S. Equitable Life Office</i>), 36 ^{bis} , <i>Avenue de l'Opéra, Paris.</i>
1903		Pekelharing, Dr G., 8, <i>Zeeuwsstraat, Rotterdam.</i>
1891	<i>d</i>	Penn-Lewis, William, <i>The Woodlands, Great Glen, near Leicester.</i>
1902	<i>d</i>	Peters, Edward T. (<i>U.S. Dept. of Agriculture</i>), 58, <i>Savernake-road, Hampstead, N.W.</i>

Year of Election.		
1890		Peters, John Wyatt, 5, <i>King's-road, Southsea.</i>
1883		Petheram, Frederick William, F.C.A., <i>Moorfield-chmbrs., 95, Finsbury-pavement, E.C.</i>
1886		Peto, Sir Henry, Bart., M.A., <i>Chedington Court, Misterton, Crewkerne, Somersetshire.</i>
1887		Phelps, Lieut.-General Arthur, 23, <i>Augustus-road, Edgbaston, Birmingham.</i>
1886	<i>d</i>	*Phelps, Rev. Lancelot Ridley, M.A., <i>Oriel College, Oxford.</i>
1871	<i>d</i>	*Pickering, John, F.R.G.S., F.S.A., 86, <i>Thicket-road, Anerley, S.E.</i>
1898		Pietersen, James Frederick Gerhard, L.R.C.P., M.R.C.S., <i>Ashwood House, Kingswinford, Dudley.</i>
1900	<i>d</i>	Pigon, Arthur Cecil, M.A., <i>King's College, Cambridge.</i>
1904		Pilling, John Albert, 5, <i>London Wall Bldgs., Finsbury Circus, E.C.</i>
1878	<i>d</i>	*Pim, Joseph Todhunter, <i>Rinnamara, Monkstown, Co. Dublin</i>
1886		Pink, J. Francis, 62, <i>Chandos-street, Strand, W.C.</i>
1903		Pirrie, The Right Hon. William James, LL.D., <i>Downshire House, Belgrave-square, S.W.</i>
1890	<i>c d</i>	Pittar, Sir Thomas John, K.C.B., C.M.G., <i>Custom House, E.C.</i>
1881		Planck, Charles, M.R.C.S. (<i>Deputy Surgeon-General</i>), <i>Lyden Croft, Edenbridge, Kent.</i>
1902		Plant, Alfred Thomas, <i>Accountant's Office, G.W.R., Puddington.</i>
1883	<i>d</i>	Platt, James, 19, <i>Rosslyn Hill, Hampstead, N.W.</i>
1895		Platt-Higgins, Frederick, M.P., <i>Queen Anne's-mansions, St. James's-park, S.W.</i>
1901		Plender, William, 5, <i>London Wall Buildings, Finsbury Circus, E.C.</i>
1861	<i>c d</i>	Plowden, Sir William Chicele, K.C.S.I., 5, <i>Park-crescent, Portland-place, W.; and</i> <i>Aston Rowant House, Tetsworth, Oxon.</i>
1905		Pocock, Bernard George, A.S.A.A., 197, <i>High Holborn, W.C.</i>
1896		*Pontifex, Bryan, A.C.A., <i>East India Railway House, Calcutta.</i>
1891		Pope, Henry Richard, <i>Ildesleigh Mansions, Westminster, S.W.</i>
1891		Potter, Henry, 276, <i>Queen's-road, New Cross Gate, S.E.</i>

Year of Election.		
1879	<i>c d p</i>	*POWELL, SIR FRANCIS SHARP, BART., M.P., (Honorary Vice-President), Horton Old Hall, Bradford, and 1, Cambridge-square, Hyde-park, W.
1871		Power, Edward, 16, Southwell-gardens, South Kensington, S. W.
1877		*Prance, Reginald Heber, Frogual, Hampstead, N. W.
1877	<i>d</i>	Praschkauer, Maximilian, Queen Anne's Mansions, St. James's-park, S. W.
1867		*Pratt, Robert Lindsay, 80, Bondgate, Darlington.
1896		Pretyman, Captain Ernest George, M.P., Orwell-park, Ipswich.
1887	<i>c d p</i>	*PRICE, L. L., M.A., Oriel College, Oxford.
1877	<i>c d p</i>	Price-Williams, Richard, M.Inst.C.E., 18, Chandos-road, Willesden Green.
1897	<i>d</i>	Primrose, Sir Henry William, K.C.B., C.S.I., Inland Revenue Office, Somerset House, W.C.
1887	<i>c d p</i>	PROBYN, LESLEY CHARLES, 79, Onslow-square, S. W.
1889		Probyn, Lieut.-Colonel Clifford, 55, Grosvenor-street, Grosvenor-square, W.
1886		Provand, Andrew Dryburgh, 2, Whitehall-court, S. W.
1896		Pryor, Edward Thomas, 23, Fore-street, E.C.
1902		Puckle, Raymond Autiere, 19, de Crespigny-park, London, S.E.
1871	<i>c</i>	Puleston, Sir John Henry, 44, Coleman-street, E.C.
1901		Quin, Stewart Blacker, F.C.A., 1, Lombard-street, Belfast.

Year of Election.		
1883		Rabbidge, Richard, F.C.A., 32, <i>Poultry, E.C.</i>
1872	<i>d p</i>	*Rabino, Joseph, <i>Chief Manager, Imperial Bank of Persia, Teheran.</i>
1888		*Radcliffe, Sir David, J.P., <i>Rosebank, Knowsley, Prescott.</i>
1858		*Radstock, The Right Hon. Lord, <i>Mayfield, Woolston, Southampton.</i>
1885	<i>c d</i>	Rae, John, M.A., 1, <i>Rockland-road, Putney, S.W.</i>
1887	<i>d p</i>	Raffalovich, His Excellency Arthur, 19, <i>Avenue Hoche, Paris.</i>
1880	<i>c</i>	Rankin, Sir James, Bart., M.P., 35, <i>Ennismore-gardens, Prince's-gate, S.W.</i>
1897		Ranson, Albert, <i>Tavern-street, Ipswich.</i>
1903		Rathbone, Miss Eleanor F., <i>Green Bank, Liverpool.</i>
1874	<i>c d p</i>	*Ravenstein, Ernest George, F.R.G.S., 2, <i>York-mansions Battersea-park, S.W.</i>
1877		*Rawlins, Thomas, 45, <i>King William-street, E.C.</i>
1895		Rawlinson, Albert, 22, <i>Ryder-street, St. James's, S.W.</i>
1893		Rea, Charles Herbert Edmund, 223, <i>Norwood-road, Herne-hill, S.E.</i>
1889		*Reed, Thomas, F.C.A., 63, <i>King-street, South Shields.</i>
1903		Reilly, John, 17, <i>Nassau-street, Dublin.</i>
1888	<i>c d p</i>	REW, R. HENRY (<i>Hon. Secretary</i>), <i>Board of Agriculture and Fisheries, 3, St. James's-square, S.W.</i>
1886		Rhens, Robert, 77, <i>Amhurst-road, Hackney, N.E.</i>
1888		Rhodes, George Webber, 131, <i>Wool Exchange, E.C.</i>
1895		Richards, Roger C. (<i>Inver Temple</i>), 14b, <i>Hyde Pk. Mansions, Marylebone-rd., W.C.</i>
1895		Richardson, Sir Thomas, <i>Kirkclington Grange, Yarm, Yorks.</i>
1903		Ripon, The Right Rev. the Lord Bishop of, <i>The Palace, Ripon.</i>
1873		Ripon, The Most Hon. the Marquess of, K.G., F.R.S., 9, <i>Chelsea Embankment, S.W.</i>
1892		Rivington, Francis Hansard, 44, <i>Connaught-square, W.</i>
1882		Roberts, Edward, F.R.A.S. (<i>Nautical Almanac Office</i>), 3, <i>Verulam-buildings, Gray's Inn, W.C.</i>
1894	<i>d p</i>	Robertson, James Barr, <i>National Liberal Club, Whitehall-place, S.W.</i>

Year of Election.		
1900		Robinson, James. <i>Clarendon House, Clayton-st. W., Newcastle-on-Tyne.</i>
1904		Rogers, Arthur George Liddon, M.A., <i>Board of Agriculture and Fisheries, 4, Whitehall-place, S. W.</i>
1901	d	Rogers, John Innes, <i>119, Cannon-street, E. C.</i>
1880		*Ronald, Byron L., <i>14, Upper Phillimore-gardens, W.</i>
1873	c	*Rosebery, The Rt. Hon. the Earl of, K.G., K.T., F.R.S., <i>38, Berkeley-square, W.</i>
1904	d p	Rosenbaum, Simon, <i>18, The Avenue, Bedford-park, W.</i>
1892	d	Ross, Charles Edmonstone, F.S.A.A., <i>Public Works Department, Chepauz, Madras.</i>
1900		Ross, John Howlett (<i>Australian Financial Gazette</i>), <i>Queen-street, Melbourne, Victoria.</i>
1897		Rothwell, William Thomas, J.P., <i>Newton Heath, near Manchester.</i>
1904		Routly, William Henry, <i>Borough Accountant, Folkestone.</i>
1899	d	Rowntree, Benjamin Seelohm, <i>32, St. Mary's, York.</i>
1898	d p	Rozenraad, Cornelius, <i>4, Moreton-gardens, South Kensington, S. W.</i>
1890		Ruffer, Marc Armand, C.M.G., M.A., M.D., B.Sc., <i>Ramleh, Egypt.</i>
1903		Runciman, Walter, M.A., M.P., <i>West Denton Hall, Scotswood-on-Tyne.</i>
1888	d	Rusher, Edward Arthur, F.I.A., <i>142, Holborn Bars, E. C.</i>
1886		Russell, Arthur B., F.C.A. (11, <i>Ludgate-hill, E. C.</i>), <i>17, Roslyn-hill, Hampstead. N. W.</i>
1878	d	Russell, Richard F., <i>8, John-street, Adelphi, W. C.</i>
1902		Ruttkay, W. de, LL.D. (<i>Austro-Hungarian Consulate</i>), <i>22, Laurence Pountney-lane, E. C.</i>
1894	d	Sachs, Edwin Otho, <i>3, Waterloo-place, Pall Mall, S. W.</i>
1898	d	Salmon, Richard George, F.I.A., <i>Sun Life Ass. Soc., Threadneedle-st., E. C.</i>

Year of Election.		
1875	<i>d</i>	*Salomons, Sir David Lionel, Bart., J.P., <i>Broom-hill, Tunbridge Wells.</i>
1899	<i>d</i>	Sanderson, Frank, M.A., <i>Canada Life Ass. Co., Toronto, Canada.</i>
1895		Sanger, Charles Percy, M.A., <i>58, Oakley-street, Chelsea, S.W.</i>
1891		*Sarda, Pandit Har Bilas, B.A., M.R.A.S., <i>Government College, Ajmere, India.</i>
1886	<i>d p</i>	Sauerbeck, Augustus (<i>Helmuth Schwartz & Co.</i>), <i>3 & 4, Moorgate-street-buildings, E.C.</i>
1893		Saunders, Cecil Roy, <i>Eling House, Eling, Hants.</i>
1887		*Scarth, Leveson, M.A., <i>12, York-buildings, Adelphi, W.C.</i>
1902		Schindler, Walter, <i>Lahmeyer Elec. Co., Bank Buildings, 109—111, New Oxford-street, W.C.</i>
1904		*Schlesinger, Louis G., <i>12A, Avenida Sur 16B, Guatemala.</i>
1891	<i>d p</i>	*Schloss, David F., M.A., <i>Hill House, Wimbledon.</i>
1895		Schmidt, Hermann, <i>9, George-yard, Lombard-st., E.C.</i>
1891	<i>p</i>	Schooling, John Holt, <i>Fotheringhay Hse., Montpelier-row, Twickenham.</i>
1895		Schuurman, Willem H. A. Elink, <i>Zuandijk, Amsterdam.</i>
1883		*Schwann, John Frederick, <i>Oakfield, Wimbledon; and 6, Moorgate-st., E.C.</i>
1900	<i>d</i>	Scott, Richard Clarkson, <i>21, Water-street, Liverpool.</i>
1888		Scotter, Sir Charles, <i>Sarbiton.</i>
1880		*Seeley, Sir Charles, Bart., <i>Sherwood Lodge, Nottingham.</i>
1905		Sellar, Alexander Smith, M.A., <i>c/o Southern Life Assoc., St. George's-street, Capetown.</i>
1899		Setchfield, George Beeby (<i>Refuge Ass. Co.</i>), <i>Bentley Kop, 3, Clarkson-street, Sheffield.</i>
1886	<i>d p</i>	Seyd, Ernest J. F., <i>38, Lombard-street, E.C.</i>
1873	<i>d</i>	Seyd, Richard, <i>38, Lombard-street, E.C.</i>
1905		Seyd, Richard E. N. J., <i>38, Lombard-street, E.C.</i>
1898	<i>c p</i>	SHAW, WILLIAM NAPIER, M.A., F.R.S., D.Sc., <i>10, Moreton-gardens, South Kensington, S.W.</i>
1877	<i>c d p</i>	SHAW-LEFEVRE, THE RIGHT HON. GEORGE, M.A. (<i>Honorary Vice-President</i>). <i>18, Bryanston-square, W.</i>

Year of
Election.

1898	<i>d</i>	Sherwell, Arthur, <i>Crossways House, Reigate-hill, Surrey.</i>
1888		Shillcock, Joshua, M.A., <i>Bank of England, West Branch, Burlington-</i> <i>gardens, W.</i>
1904		Sidwell, Henry Thomas, <i>Hatfield, Herts.</i>
1905		Silva, N. P. da Motta E., <i>3, Avenue du Trocadero, Paris.</i>
1905		Silversides, Charles William, <i>Trenholme, Hendon, N. W.</i>
1904		Sim, James Duncan Stuart, <i>Ravenscroft, Nutfield, Surrey.</i>
1902		Sinclair, H. D., <i>19 and 20, Silver-street, Wood-street, E. C.</i>
1892		*Sinclair, The Right Hon. John, M.P., <i>2, Cambridge-square, W.</i>
1881	<i>d</i>	Skirne, Francis Henry B., <i>147, Victoria-street, S. W.</i>
1888		Slade, Alfred Thomas, <i>Wardrobe Chambers, Queen Victoria-street, E. C.</i>
1888		Slade, Francis William, <i>17, Victoria-street, Westminster, S. W.</i>
1883		Sly, Richard Stevens, J.P., F.R.G.S., <i>Killiney, Hatherley-road, Sidcup, Kent.</i>
1878		*Smith, Charles, M.R.I.A., F.G.S., Assoc. Inst. C.E., <i>"Park View," Englefield-green, Surrey.</i>
1878	<i>d</i>	*Smith, George, LL.D., C.I.E., <i>10, South Learmouth-gardens, Edinburgh.</i>
1889	<i>d</i>	Smith, George Armitage, M.A., <i>3, Albert-terrace, Regent's-park, N. W.</i>
1904		*Smith, Hastings B. Lees, M.A., <i>Ruskin College, Oxford.</i>
1877		Smith, Howard S., A.I.A., F.F.A., <i>Bank Chambers, 14, Waterloo-street, Birmingham.</i>
1888	<i>c d</i>	SMITH, HUBERT LLEWELLYN, C.B., M.A., B.Sc., <i>Oakfield Lodge, Ashted.</i>
1891		Smith, Right Hon. James Parker, M.P., <i>Jordanhill, Partick, N.B.</i>
1901		Smith, Robert John, C.A., <i>59, St Vincent-street, Glasgow.</i>
1905		Smith, Stanley George, <i>10, Stamford Mansions, Stamford Grove East,</i> <i>Upper Clapton, N.E.</i>
1890		Smith, William Alexander, J.P., <i>Arpafecle, Mooribank, N.S. W.</i>
1894		*Smith, The Hon. William Frederick Danvers, M.P., <i>3, Grosvenor-place, S. W.</i>
1894		Smithers, Frederick Oldershaw, <i>171, Adelaide-road, South Hampstead, N. W.</i>

Year of Election.		
1900		*Somerville, William, D.Sc., M.A., <i>Board of Agriculture and Fisheries, 4, Whitehall-place, S.W.</i>
1899		Sorley, James, F.I.A., F.F.A., F.R.S.E., <i>82, Onslow-gardens, S.W.</i>
1904		Souter, John, <i>c/o Mines Depart., P.O. Box 1132, Johannesburg.</i>
1897		Southgate, Henry William, <i>4, Priory-gardens, Hornsey, N.</i>
1895		Soward, Alfred Walter, <i>28, Therapia-road, Honor Oak, S.E.</i>
1855	d	Sowray, John Russell, <i>Golfers' Club, Whitehall-court, S.W.</i>
1904		Sowrey, John William, <i>Surveyor of Taxes, Telegraph Street, E.C.</i>
1896		Sparrow, Frederick Syer, <i>c/o J. Wonfor, 22, Yonge-pk., Seven Sisters-rd., N.</i>
1904		Spencer, Frederick Herbert, LL.B., <i>17, Tiverton-mansions, Gray's Inn-road, W.C.</i>
1867		*Spencer, Robert James,
1892		Spender, John Alfred, M.A., <i>45, Sloane-street, S.W.</i>
1897	d	Spensley, J. Calvert, <i>3, Prorost-road, S. Hampstead, N.W.</i>
1883		Spicer, Albert, <i>50, Upper Thames-street, E.C.</i>
1898		Spicer, Edward Samuel, <i>Grange Cottage, The Grange, Wimbledon.</i>
1856	d	*Sprague, Thomas Bond, M.A., LL.D., F.I.A., <i>29, Buckingham-terrace, Edinburgh.</i>
1882		Stack, Thomas Neville, <i>7, Union-court, E.C.</i>
1901		Stallard, Charles Frampton, <i>P.O. Box 5156, Johannesburg.</i>
1889	d	Stanton, Arthur G., <i>13, Rood-lane, E.C.</i>
1902		*Steel-Maitland, Arthur Herbert Drummond Ramsay, <i>72, Cadogan-square, S.W.</i>
1905		Steiner, Dr. Maximilien, <i>Graben 16, Vienna.</i>
1899		Stenberg, Ernst Gottfried, <i>Government Statistician's Office, Perth, W.A.</i>
1882		*Stern, Sir Edward D., <i>4, Carlton House-terrace, S.W.</i>
1885	d	*Stevens, Marshall, <i>18, Exchange-street, Manchester.</i>
1903	d	Stevens, William James, <i>148, Devonshire-road, Forest Hill, S.E.</i>
1904	d	Stoppelaar, Gerard Nicolaas de, <i>48, Chaussée de Charleroi, Brussels.</i>

Year of Election.		
1902		Stott, Walter Grason, 22, <i>Salisbury-road, Wavertree, Liverpool.</i>
1889		Stow, Harry Vane, 24, <i>Holborn, E.C.</i>
1872	d	Strachey, General Sir Richard, R.E., G.C.S.I., F.R.S., 69, <i>Lancaster-gate, W.</i>
1883	d	*Strathcona and Mount Royal, The Right Hon. Lord, G.C.M.G. (<i>High Commissioner for Canada</i>), 28, <i>Grosvenor-square, W.</i>
1880		Strutt, Hon. Frederick, <i>Milford House, near Derby.</i>
1884		*Sugden, Richard, <i>The Farre Close, Brighouse, Yorkshire.</i>
1895		Sutherland, J. Francis, M.D., <i>Scotsburn-road, Tain, Ross-shire.</i>
1902		Sutton, Martin John, J.P., <i>Henley-park, Henley-on-Thames.</i>
1900		Swetenham, Charles C., <i>c/o Grindlay Groom & Co., Bombay, India.</i>
1900	d p	Sykes, John Frederick Joseph, M.D., D.Sc., 40, <i>Camden-square, N.W.</i>
1904		Tatham, Basil St. John, <i>P.O. Box 1558, Johannesburg.</i>
1889	d	Tattersall, William, <i>Melbrook, Bowdon, Cheshire.</i>
1889		Taylor, Stephen Seaward (Alderman), <i>Fairholme, Mt. Ephraim-rd., Streatham, S.W.</i>
1901		Taylor, Lachlan,
1887	d	Taylor, R. Whately Cooke, 39, <i>Victoria-street, S.W.</i>
1888		*Taylor, Theodore Cooke, M.P., J.P., <i>Sunny Bank, Batley, Yorkshire.</i>
1905		Taylor, William B., B.A., LL.B., 112-118, <i>King-street West, Toronto.</i>
1893		Teece, Richard, F.I.A., F.F.A., <i>Actuary, A.M.P. Society, Sydney, N.S.W.</i>
1888	d	Temperley, William Angus, junr., 2, <i>St. Nicholas-buildings, Newcastle-on-Tyne.</i>

Year of Election.		
1888		Theobald, John Wilson, 3a, <i>Coleman-street, E.C.</i>
1889		Thodey, William Henry, 479, <i>Collins-street, Melbourne, Victoria.</i>
1888	<i>c d p</i>	THOMAS, DAVID ALFRED, M.A., M.P., <i>Llanern, near Newport, Mon.</i>
1887		Thomas, John Collette, <i>Trewine, Portscatho, Cornwall.</i>
1896	<i>d</i>	Thomas, John Tubb. L.R.C.P. & S. (Edin.), D.P.H., <i>Pevensey House, Trowbridge, Wilts.</i>
1905		Thomas, Percy Scofield, 77, <i>Amlurst-road, Hackney, N.E.</i>
1864		*Thompson, Henry Yates, 19, <i>Portman-square, W.</i>
1901	<i>d p</i>	Thompson, Robert John, <i>Board of Agriculture and Fisheries, 4, White-hall-place, S.W.</i>
1889		Touch, George Alexander, 26, <i>Collingham-gardens, South Kensington, S.W.</i>
1899	<i>p</i>	Tozer, William Henry, 28, <i>Abingdon-street, Westminster, S.W.</i>
1868		*Treatt, Frank Burford, <i>Police Magistrate, Cobar, New South Wales.</i>
1868		Tritton, Joseph Herbert, 54, <i>Lombard-street, E.C.</i>
1903	<i>d</i>	Trivett, John Burt, <i>Friendly Societies' Dept., Sydney, N.S.W.</i>
1903		Tryon, Captain George Clement, 45, <i>Eaton-place, S.W.</i>
1890		*Turner, Rev. Harward, M.D. (Paris), B.Sc., F.R.M.S.,
1885		Turner, William (c/o <i>The Librarian</i>), <i>Free Public Library, Trinity-street, Cardiff.</i>
1892	<i>d</i>	Tyler, Edgar Alfred, 9, <i>Old Jewry Chambers, E.C.</i>
1903		Unstead, John Frederick, B.A., 5, <i>Wirerton-road, Sydenham, S.E.</i>
1877	<i>c d p</i>	*Umlin, Richard Deuny, 22, <i>Stafford-terrace, Phillimore-gardens, W.</i>

Year of
Election.

1903		*Vaizey, Ker George Russell, 10, <i>Lime-street, E.C.</i>
1888		Van Raalte, Marcus, 22, <i>Austin Friars, E.C.</i>
1903		Varley, Jesse, C.A., A.C.I.S., <i>Longleat, Albert-road, Wolcerhampton.</i>
1889		*Venning, Charles Harrison, 25, <i>Laurence-lane, Cheapside, E.C.</i>
1888		Verdin, William Henry, J.P., <i>Winsford, Cheshire.</i>
1894		Verney, Frederick William, 12, <i>Connaught-place, Marble Arch, W.</i>
1886	c	Verulam, The Right Hon. the Earl of, <i>Gorhambury, St. Albans.</i>
1876		Vigers, Robert, 4, <i>Frederick's-place, Old Jewry, E.C.</i>
1905		Vigor, Harold Decimus, 23, <i>Islip-street, Kentish Town, N.W.</i>
1885		Vincent, Frederick James, A.I.A. (London, Glasgow, and <i>Edinburgh Assurance Co.</i>), 26 & 27, <i>Farringdon-street, E.C.</i>
1877	d	Vine, Sir John Richard Somers, C.M.G., <i>P.O. Box 654, Cape Town, South Africa.</i>
1904		Vinter, James Odell, J.P., <i>Southfield, Trumpington, Cambs.</i>
1902		Wacha, Dinsha Edulji, 84, <i>Hornby-road, Fort, Bombay.</i>
1905		Wadia, N. P. N., M.S.A.A., <i>Alice Buildings, Hornby-road, Fort, Bombay</i>
1904		Wagner, H. R., 120, <i>Bishopsgate-street Within, E.C.</i>

Year of Election.		
1902		Wahrmann, Ernest, <i>Gisellaplatz, 5, Budapest.</i>
1900		Walford, Adolphus Augustus Beddall (<i>Frank Brown & Co.</i>), <i>Finkle Chambers, Stockton-on-Tees.</i>
1890	<i>d</i>	Walford, Ernest Leopold, <i>11c. Hyde Park-mansions, Marylebone-rd., N.W.</i>
1903	<i>d</i>	Wall, Edgar George, <i>29. Palliser-road, West Kensington, W.</i>
1904	<i>d</i>	Wall, Walter William, <i>26. Bradgate-road, Catford, S.E.</i>
1905		Wallis, B. Cotterell, F.C.P., B.Sc. (Econ.), <i>3, Darenth-road, Stamford Hill, N.</i>
1868		Wallis, Charles James, <i>Hoe, Gomshall, Guildford.</i>
1880	<i>d</i>	Wallis, E. White, <i>Upper Frogual Lodge, Hampstead, N.W.</i>
1904		*Walsh, Correa Moylan, <i>Bellport. Long Island, New York, U.S.A.</i>
1900	<i>d</i>	Wamsley, Arthur Wilson, <i>Royal Exchange Ass. Co., Royal Exchange, E.C.</i>
1899		Ward, Joseph Frederick, <i>8, Main-street. Port Elizabeth.</i>
1893		Ward, William Cullen, F.S.I.A., <i>113, Pitt-street, Sydney, N.S.W.</i>
1888		Warren, Reginald Augustus, J.P., <i>Preston-place, near Worthing.</i>
1865		Waterhouse, Edwin. B.A., A.I.A., F.C.A., <i>3, Frederick-place, Old Jewry, E.C.</i>
1886	<i>p</i>	Waters, Alfred Charles, <i>General Register Office, Somerset House, W.C.</i>
1892		Wates, Charles Marshall, <i>47, Westbere-road, West Hampstead, N.W.</i>
1904		Watkins, John Milton, <i>"Statist" Office, 51, Cannon-street, E.C.</i>
1902	<i>d</i>	Watson, Alfred William, F.I.A., <i>Wenhaston, Ebers-rd., Mapperley-pk., Notts.</i>
1903	<i>d</i>	Watson, Ralph Cook, <i>31, Sanderson-road, Newcastle-on-Tyne.</i>
1885	<i>d</i>	*Watt, William, <i>17. Queen's-road, Aberdeen.</i>
1888		Webb, Henry Barlow, <i>Holmdale, Dorking.</i>
1904	<i>d</i>	Webb, The Hon. Mr. Montagu de Pomeroy, C.I.E. <i>Karachi, India.</i>
1893	<i>d</i>	Weedon, Thornhill, <i>Gort. Statistician, Bryn-Mawr, Brisbane.</i>
1873	<i>c</i>	*Welby, The Right Hon. Lord, G.C.B., <i>11. Stratton-street, Piccadilly, W.</i>

Year of Election		
1874		Welch, Charles, F.S.A., <i>Guildhall, E.C. (Representing the Library Committee of the Corporation of the City of London.)</i>
1900		Weldon, Francis Seymour, <i>Sarandi. East Molesey.</i>
1889		*Wells-Smith, Henry, F.C.A., <i>"Hillcrest," Blyth-grove, Worksop, Notts.</i>
1855	c d p	WELTON, THOMAS ABERCROMBIE, F.C.A., <i>22, Palace-road, Streatham-hill, S.W.</i>
1902		Westall, George, <i>87, Chancery-lane, W.C.</i>
1879		*Westlake, John, K.C., LL.D., <i>The River House, 3, Chelsea Embankment.</i>
1901		Weston, Sydney Frank, <i>19, Epperstone-rd., W. Bridgford, Nottingham.</i>
1882		*Whadcoat, John Henry, F.C.A., <i>Rockcliffe, Kirkcudbrightshire.</i>
1878		Wharton, James, <i>Edgehill, Netherhall-gds., Fitzjohn's-av., N.W.</i>
1887		Whinney, Frederick, <i>8, Old Jewry, E.C.</i>
1859		Whitbread, Samuel, <i>Southili-park, Biggleswade, Beds.</i>
1887		*White, The Rev. George Cecil, M.A., <i>Nursling Rectory, Southampton.</i>
1905		White, Richard, F.C.I.S., <i>Folkestone Chamber of Commerce, Folkestone</i>
1888	d	Whitehead, Sir James, Bart., J.P., D.L., <i>Wilmington Manor, near Dartford.</i>
1895	d	Whitehead, The Hon. Thomas Henderson, M.L.C., <i>Chartered Bank of India, &c., Hong Kong.</i>
1892	c d	WHITELEGGE, B. ARTHUR, C.B., M.D., <i>3, Edwards-place, Kensington, W.</i>
1884	d	Whiteley, William, <i>31, Porchester-terrace, Hyde-park, W.</i>
1895		Whittuck, Edward Arthur, M.A., B.C.L., <i>Claverton Manor, Bath.</i>
1899		Wiener, Isidore, <i>Colecroft, Kenley, Surrey.</i>
1898		Wigham, Matthew Thomas, A.S.A.A., <i>826, Salisbury House, London Wall, E.C.</i>
1884		Wightman, Charles, <i>1, Finchurch-avenue, E.C.</i>
1895		Wilenskin, Gregory, <i>1501, Eighteenth-st., Washington, D.C., U.S.A.</i>
1904		Wilkins, Henry H. J., <i>St. Tydfil Chambers, Queen-street, Cardiff.</i>
1860		Willans, John Wrigley, <i>National Liberal Club, Whitehall-place, S.W.</i>
1902		Willby, Percy Luck, <i>810—11, Salisbury House, London-wall, E.C.</i>

Year of Election.		
1901	<i>d</i>	Willcox, Walter F., Ph.D., <i>Cornell University, Ithaca, New York, U.S.A.</i>
1896		*Williams, Major Charles Woolmer, <i>245, Shaftesbury-avenue, New Oxford-st., W.C.</i>
1897		*Williams, Ernest E., <i>Ecclefechan, Lake-road, Wimbledon, S.W.</i>
1904		Williams, Frederick Alfred, A.I.A., <i>Hurstpierpoint, Horchurch, Essex.</i>
1864		Williams, Frederick Bessant, F.S.A. (Scot.), <i>19, Haymarket, S.W.</i>
1895		Williams, Harry Mallam, F.S.A. (Scot.), <i>Tilehurst, Priory-park, Kew.</i>
1888		*Williams, Robert, M.P., <i>20, Birchin-lane, E.C.</i>
1895		*Willis, J. G., B.A., <i>Board of Trade, Whitehall-gardens, S.W.</i>
1901		Wilson, George Thomson (<i>Equitable Life Ass. Soc. of U.S.</i>), 120, Broadway, New York.
1891		Wilson, Henry Joseph, M.P., <i>Osgathorpe Hills, Sheffield.</i>
1898		Wilson, Herbert Wrigley, <i>203, Elgin-avenue, W.</i>
1884		Wilson, Hon. James, C.S.I., <i>Secretary to Government, Calcutta, India.</i>
1900	<i>d</i>	Wolfe, S. Herbert, <i>35, Nassau-street, New York City, U.S.A.</i>
1900		Wolfenden, Henry, <i>1, Palace-court, Hyde-park, W.</i>
1902		Wolfner, Dr. Paul, <i>Andrássy-ut 10. sz., Budapest.</i>
1902	<i>d</i>	Wood, Alfred John, I.S.O., <i>Statistical Office, Custom House, E.C.</i>
1897	<i>d p</i>	Wood, George Henry, <i>14, McLeod-road, Abbey Wood, Kent.</i>
1897		Woodd, Basil Aubrey Holland, <i>41, Onslow-gardens, S.W.</i>
1887	<i>d</i>	Woodhouse, Coventry Archer, <i>30, Mincing-lane, E.C.</i>
1902		Woodhouse, Lister, A.C.A., <i>Westminster City Hall, Charing Cross-rd., W.C.</i>
1890		*Woollcombe, Robert Lloyd, LL.D., &c., <i>14, Waterloo-road, Dublin.</i>
1903		Woolley, Ernest, <i>7, Finch-lane, Cornhill, E.C.</i>
1895		Worsfold, Edward Mowll, <i>Market Square, Dover</i>
1878		Worsfold, Rev. John Napper, M.A., <i>Haddlesey Rectory, near Selby, Yorks.</i>
1887		Worthington, A. W., B.A., <i>Old Swinford, Stourbridge.</i>

Year of Election.		
1895	<i>d</i>	Yanagisawa, Count Yasutoshi, 1, <i>Shiba Yamachi</i> , 8, <i>Chôme</i> , <i>Tokio</i> , <i>Japan</i> .
1886	<i>c d p</i>	Yerburgh, Robert Armstrong, M.P., 25, <i>Kensington Gore</i> , <i>S. W.</i>
1900		Yerbury, John Edwin, 24, <i>The Pryors</i> , <i>E. Heath-road</i> , <i>Hampstead</i> , <i>N. W.</i>
1888		*Yglesias, Miguel, 2, <i>Tokenhouse-buildings</i> , <i>E. C.</i>
1902		Yorke, Captain James Austin, 213, <i>The Grove</i> , <i>Hammersmith</i> , <i>W.</i>
1877		*Youll, John Gibson, <i>Jesmond-road</i> , <i>Newcastle-on-Tyne</i> .
1898		Young, Sydney, <i>The Corn Exchange</i> , <i>Mark-lane</i> , <i>E. C.</i>
1895	<i>c d p</i>	Yule, George Udny, <i>City & Guilds Institute</i> , <i>Exhibition-road</i> , <i>S. W.</i> ; <i>St. James's-court</i> , <i>Buckingham-gate</i> , <i>S. W.</i>
1901		Zimmerman, Lawrence Wolff, 5, <i>Edensor-place</i> , <i>Dickenson-road</i> , <i>Rusholme</i> , <i>Manchester</i> .

* * * *The Honorary Secretaries request that any inaccuracy in the foregoing list, and all changes of address, may be notified to the ASSISTANT SECRETARY.*

HONORARY FELLOWS.

HIS MOST GRACIOUS MAJESTY THE KING,
Patron.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.,
Honorary President.

Argentine Republic.

Year of Election		
1890	<i>d</i>	FRANCISCO LATZINA, Calle Maipu, 982, Buenos Ayres. Director General of Statistics; Doctor <i>honoris causa</i> of the Faculty of Physical and Mathematical Sciences of the University of Córdoba; Knight of the Italian Order of S.S. Maurice and Lazare; Officer of the Academy of France; Member of the National Academy of Sciences, of the International Statistical Institute, of the Geographical and Statistical Societies of Paris, of the Society of Commercial Geography of Paris, and Corresponding Member of the National Historical Academy of Venezuela.

Austria-Hungary.

1890	<i>d</i>	KARL THEODOR VON INAMA-STERNEGG, Vienna. Doctor of Political Economy; Member of the Austrian House of Lords; Ex-President of the Imperial and Royal Central Statistical Commission; Professor at the University of Vienna; President of the International Statistical Institute.
1893	<i>d</i>	FRANZ RITTER VON JURASCHEK, Kärnthnerstrasse, 55, Vienna. Doctor <i>Juris et Philosophie</i> ; "K.K. Regierungsrath;" President of the Imperial and Royal Central Statistical Commission; Professor at the University of Vienna; Professor of Public Law and of Statistics at the Military Academies, Vienna; Knight of the Austrian Order of the Iron Crown (3rd Class); Officer of the Order of the Crown of Italy; Member of the Permanent Commission for Commercial Values; of the International Statistical Institute; and of the Royal Economic Society.
1893	<i>d p</i>	JOSEPH KÖRÖSI, Budapest. Director of the Municipal Statistical Bureau of Budapest; <i>Docent</i> at the University of Budapest; President of the Municipal Statistical Committee; Knight of Several Orders; Member of the Statistical Commissions of Hungary, Belgium, and Nijni-Novgorod; Honorary Member of the American Statistical Associations; Member of the Hungarian Academy of Science, of the International Statistical Institute, of the Statistical Societies of Manchester and Paris, of the Royal Economic Society, and of several other learned Societies.

Year of
Election**Austria-Hungary—Contd.**

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| 1904 | <i>d</i> | JULES DE VARGHA, Budapest.
Director of the Central Statistical Bureau of Hungary;
President of the Commission for the preparation of the
annual administration report on Hungary; Member of
the International Statistical Institute. |
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Belgium.

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| 1904 | <i>d</i> | EMILE WAXWEILER, Parc Leopold, Brussels.
Honorary Engineer of Roads and Bridges; Director of the
Sociological Institute, Brussels; Professor of Economics
and Finance at the University of Brussels; Superintendent
of Statistical Section of Labour Department; Member of
the International Statistical Institute. |
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China.

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| 1890 | <i>d</i> | SIR ROBERT HART, Baronet, G.C.M.G., LL.D., Peking.
Inspector-General of Imperial Maritime Customs, China. |
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Denmark.

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| 1878 | <i>d</i> | VIGAND ANDREAS FALBE-HANSEN, Copenhagen.
Director of the Statistical Bureau of the State; late Professor
of Political Economy at the University of Copenhagen. |
| 1900 | <i>d p</i> | MARCUS RUBIN, Vendersgade 25a, Copenhagen.
Knight of the Order of the "Danebrog"; Director-General
of Customs and Taxation; late Director of the Statistical
Bureau of the State; President of the Danish Society of
Political Economy and of the Board of the Danish Society
of History; Member of the International Statistical
Institute. |

France.

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| 1880 | <i>d p</i> | JACQUES BERTILLON, M.D., 1, Avenue Victoria, Paris.
Chief of the Statistical Department of the City of Paris;
Member of the Superior Council of Statistics; of the
Consultative Committee of Public Hygiene of France;
Past President of the Statistical Society of Paris; and
Member of the International Statistical Institute, &c. |
| 1879 | <i>d</i> | ARTHUR CHERVIN, M.D., 82, Avenue Victor Hugo, Paris.
Doctor of Medicine and Surgery; Director of the Paris
Institute for Stammerers; Vice-President of the Sta-
tistical Society of Paris; Member of the Superior
Institute, &c. |

Year of Election.		France— <i>Contd.</i>
1897	<i>d</i>	JEAN JACQUES ÉMILE CHEYSSON, 4, Rue Adolphe Yvon, Paris. Inspector-General of Bridges and Highways; Member of the International Statistical Institute; Past President of the Statistical Society of Paris; late Director of the Creusot Iron Works, of Machinery at the Paris Exhibition of 1867, and of Graphic Statistics for the Ministry of Public Works.
1890	<i>d p</i>	ALFRED DE FOVILLE, 3, Rue du Regard, Paris. Late Master of the Mint; Councillor of the Court of Accounts; Officer of the Legion of Honour; Member of the Institute of France; Past President of the Statistical Society of Paris; Member of the International Statistical Institute and of the Superior Council of Statistics.
1860	<i>d p</i>	PIERRE ÉMILE LEVASSEUR, Collège de France, Paris. Member of the Institute of France; Professor at the College of France and at the Conservatoire of Arts and Trades; President of the Statistical Commission for Primary Instruction; Past President of the Statistical Society of Paris; Vice-President of the International Statistical Institute, of the Superior Council of Statistics, and of the Society of Political Economy, &c.
1887		DANIEL WILSON, 2, Avenue d'Jéna, Paris. Ex-Under-Secretary of State; Past President of the Statistical Society of Paris.
1876	<i>d</i>	THE PRESIDENT (for the time being) OF THE STATISTICAL SOCIETY OF PARIS, 28, Rue Danton, Paris.
Germany.		
1890	<i>d</i>	KARL JULIUS EMIL BLENCK, Lindenstrasse, 28, Berlin, S.W. "Wirklicher Geheimer Ober-Regierungsrat;" Director of the Royal Statistical Bureau of Prussia, also Member of the Prussian Central Statistical Commission and of the Central Board of Control of the Survey of Prussia; Member of the International Statistical Institute; Honorary Member or Member of several learned Societies.
1896	<i>d</i>	CARL VICTOR BÖHMERT, Hospitalstrasse, 4, Dresden. "Geheimer Regierungsrath;" Doctor <i>Juris</i> ; Late Director of the Statistical Bureau of Saxony; Professor of Political Economy and Statistics in the Polytechnical High School of Dresden; Member of the International Statistical Institute.
1904	<i>d</i>	DR. WILHELM LEXIS, Göttingen. Professor of Economics and Statistics at the University of Göttingen; Vice-President of the International Statistical Institute.

Germany—Contd.

Year of Election		
1877	d	<p>GEORG VON MAYR, Georgenstrasse, 38, Munich. Ex-Under Secretary of State in the Imperial Ministry for Alsace-Lorraine; formerly Director of the Royal Statistical Bureau of Bavaria; Honorary Member of the International Statistical Institute; Ordinary Professor of Statistics, Finances, and Political Economy at the University of Munich; Associate of the Statistical Society of Paris.</p>
1897		<p>ADOLPH WAGNER, Ph.D., 51, Lessingstrasse, Berlin, N.W. Professor of Political Economy at the University of Berlin; Member of the Statistical Bureau of Prussia, and of the International Statistical Institute.</p>
1876	d	<p>THE PRESIDENT (for the time being) OF THE GEOGRAPHICAL AND STATISTICAL SOCIETY OF FRANKFORT, Stadtbibliothek, Frankfort.</p>

Italy.

1874	d	<p>LUIGI BODIO, 153, Via Torino, Rome. Senator; Doctor of Laws; Professor of Industrial Legislation and of Statistics at the Engineering College, Rome; Councillor of State; Commissioner-General of Emigration; Secretary of the International Statistical Institute; Grand Officer of the Order of SS. Maurice and Lazare; Knight of the Order of Civil Merit of Savoy; Correspondent of the Institute of France (Academy of Moral and Political Sciences).</p>
1899	d	<p>CARLO FRANCESCO FERRARIS, Via 20 settembre, 7, Padua. Professor of Administrative Science and Law, and of Statistics at the Royal University of Padua; Member of the Superior Council of Statistics and of the Superior Council of Public Education of Italy; Member of the Academy "dei Lincei," of the Royal Institute of Science at Venice, of the International Statistical Institute, and Honorary Member of the Swiss Statistical Society; Ex-Member of the Italian Parliament.</p>
1904		<p>FEDELE LAMPERTICO, Vicenza. Senator; Member of the Academy "dei Lincei"; President of Venice Institute of Science and Literature; Member of the Judicial Statistical Committee for Italy; Honorary Member of International Statistical Institute.</p>

Mexico.

1895	d	<p>DON MANUEL FERNANDEZ LEAL, Mexico. Director of the Mint; Late Secretary of State, Department of "Fomento," Colonization and Industry.</p>
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Year of
Election

Netherlands.

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| 1896 | <i>d</i> | NICOLAAS GERARD PIERSON, The Hague.
Minister of Finance; Late President of the Netherlands Bank; Late Professor of Political Economy at the University of Amsterdam; Member of the International Statistical Institute. |
| 1904 | <i>d</i> | C. A. VERRIJN STUART, The Hague.
Director of the Central Statistical Bureau of the Netherlands; Member of the Central Commission of Statistics; Corresponding Member of Statistical Society of Paris; Member of International Statistical Institute. |

Norway.

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| 1858 | <i>d</i> | THORKIL HALVORSEN ASCHEHOUG, 41, Josephinegade Christiania.
Doctor of Laws; Professor of Political Economy at the University of Christiania; Assessor Extraordinary of the Supreme Court of Norway; Commander of the First Class of the Norwegian Order of St. Olave, of the Swedish Order of the North Star; and of the Danish Order of the "Dannebrog;" Corresponding Member of the Institute of France; Member of the Institute of International Law, of the International Statistical Institute, and of the Academies of Christiania, Stockholm, Trondhjem and Upsala, also of the Royal Historical Society of Denmark. |
| 1874 | <i>d</i> | ANDERS NICOLAI KIÆR, Christiania.
Director of the Central Statistical Bureau of Norway; Associate of the Statistical Society of Paris; Member of the International Statistical Institute. |

Roumania.

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| 1896 | <i>d</i> | GRÉGOIRE P. OLANESCO, Rue Grivitz 36, Bucharest.
Late Director-General of Customs; Late General Secretary, Ministry of Finance; Officer of the Legion of Honor; Member of the International Statistical Institute. |
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Russia.

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| 1873 | <i>d</i> | HIS EXCELLENCY PIERRE SEMENOV, St. Petersburg.
Senator; Privy Councillor to His Imperial Majesty; President of the Imperial Statistical Council; President of the Imperial Geographical Society; Honorary Member of the Academy of Sciences in St. Petersburg; Associate of the Statistical Society of Paris. |
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Year of
Election.
1890

Russia—Contd.

d HIS EXCELLENCY NICOLAS TROÏNITSKY, **Mohovaia 6, St. Petersburg.**

Former Governor; Senator; Privy Councillor; late Director of the Central Statistical Committee of the Ministry of the Interior; President of the Statistical Council, Life Member of the Imperial Geographical Society of Russia, Vice-President of the International Statistical Institute, and Member of the Statistical Society of Paris.

Spain.

1845 HIS EXCELLENCY SEÑOR DON JOSÉ MAGAZ Y JAYME, **Calle de Leon, 13, Madrid.**

Advocate, Gentleman of His Majesty's Chamber, and Member of the Council of State; Ex-Deputy of the Cortes; Ex-Senator; Ex-Director-General of Treasury; Ex-Under-Secretary of the Ministry of Finance; Grand Cross of the Order of Isabella Catolica; Commander of the Order of Carlos 3^o.

Sweden.

1890 *d* ELIS SIDENBLADH., Ph.D., **Stockholm.**

Late Director in Chief of the Central Statistical Bureau of Sweden; Late President of the Royal Statistical Commission; Commander, Officer, and Knight of several Swedish and Foreign Orders; Member of the Royal Academies of Sciences and of Agriculture, at Stockholm, of the International Statistical Institute, and Honorary and Corresponding Member of several foreign learned Societies.

Switzerland.

1890 *d* LOUIS GUILLAUME, **Bern.**

Doctor of Medicine; Director of the Federal Statistical Bureau; Secretary of the International Penitentiary Commission; Member of the International Statistical Institute.

United States.

1873 THE HON. WILLIAM BARNES, **Thurlow-terrace, Albany, N.Y.**

Lawyer; Ex-Superintendent of the Insurance Department, State of New York.

1881 *d* JOHN SHAW BILLINGS, **New York Public Library, New York City.**

M.A., M.D., LL.D., Edinburgh and Harvard; D.C.L., Oxon; Surgeon, U.S. Army; Member of the National Academy of Sciences, of the International Statistical Institute, &c.

Year of
Election.
1896

United States—Contd.

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| 1896 | d | <p>WORTHINGTON CHAUNCEY FORD, 3430, Tolson Place, Washington, D.C.
 Late Chief of the Bureau of Statistics, Treasury Department;
 Chief of the Bureau of Statistics, Department of State;
 Member of the International Statistical Institute.</p> |
| 1870 | d | <p>THE HON. JOHN ELIOT SANFORD, Taunton, Mass.
 Lawyer; Ex-Speaker of the House of Representatives; Ex-Insurance Commissioner; Ex-Chairman of the Board of Harbours and Land Commissioners; Chairman of the Board of Railroad Commissioners.</p> |
| 1893 | d | <p>THE HON. CARROLL DAVIDSON WRIGHT, M.A., LL.D., Washington, D.C.
 Commissioner of the U.S. Department of Labour; late Chief of the Massachusetts Bureau of Statistics of Labour; President of the Association for the promotion of Profit Sharing; late President and now Vice-President of the American Social Science Association; President of the American Statistical Association; Member of the American Economic Association, of the Royal Economic Society, and of the International Statistical Institute; Hon. Member of the Russian Imperial Academy of Sciences; Corresponding Member of the Institute of France; and Member of several other learned Societies.</p> |
| 1877 | d | <p>EDWARD YOUNG, M.A., Ph.D., 207, Maryland Avenue, N.E., Washington, D.C.
 Late Consul of the United States; formerly Chief of the Bureau of Statistics, United States of America; Member of the Geographical Society of Paris.</p> |

Dominion of Canada.

- | | | |
|------|---|---|
| 1894 | d | <p>GEORGE JOHNSON, Ottawa.
 Statistician, Department of Agriculture, Ottawa, Canada.</p> |
|------|---|---|

New Zealand.

- | | | |
|------|---|--|
| 1876 | d | <p>SIR JAMES HECTOR, K.C.M.G., M.D., F.R.S.S. L. and E., F.G.S., &c., Petone.
 Director of the Geological Survey, of the Meteorological Department, and of the New Zealand Institute, &c.</p> |
|------|---|--|

Tasmania.

- | | | |
|------|---|---|
| 1894 | d | <p>ROBERT MACKENZIE JOHNSTON, I.S.O., Hobart.
 Registrar-General and Government Statistician; Fellow and Member of Council of the Royal Society of Tasmania; Member of Council and of Senate of the University of Tasmania; Fellow and Past President of Section F (<i>Economics and Statistics</i>) of the Australasian Association for the Advancement of Science; Fellow of the Royal Geographical Society of Australia; Honorary Foreign Corresponding Member of the Geological Society of Edinburgh; Fellow of the Linnean Society of London.</p> |
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Year of
Election.
1876

d p

Tasmania—Contd.

EDWIN CRADOCK NOWELL, I.S.O., J.P., Hobart.

Clerk of Legislative Council of Tasmania; late Government Statistician; Clerk to the Federal Council of Australasia in its seven Sessions.

Victoria.

1858

d

WILLIAM HENRY ARCHER, K.C.P., K.S.G., F.I.A., F.L.S., &c., 21, Hornby Street, Windsor, Melbourne.
Barrister-at-Law.

Great Britain and Ireland.

1876

d

THE PRESIDENT (for the time being) OF THE MANCHESTER STATISTICAL SOCIETY, 3, York Street, Manchester.

1876

d

THE PRESIDENT (for the time being) OF THE STATISTICAL AND SOCIAL INQUIRY SOCIETY OF IRELAND, 35, Molesworth Street, Dublin.

* * * The Honorary Secretaries request that any inaccuracies in the List of HONORARY FELLOWS, and all changes of address, may be notified to the Assistant Secretary.

ROYAL STATISTICAL SOCIETY.

Copy of Charter.

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith.

To all to whom these Presents shall come, Greeting :—

Whereas Our Right trusty and entirely beloved cousin, Henry, Third Marquess of Lansdowne, Knight of the Most Noble Order of the Garter, Charles Babbage, Fellow of the Royal Society, John Elliott Drinkwater, Master of Arts, Henry Hallam, Fellow of the Royal Society, the Reverend Richard Jones, Master of Arts, and others of Our loving subjects, did, in the year One thousand eight hundred and thirty-four, establish a Society to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social, and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method, and the same Society is now called or known by the name of “The “Statistical Society.”

And Whereas it has been represented to Us that the same Society has, since its establishment, sedulously pursued such its proposed objects, and by its publications (including those of its transactions), and by promoting the discussion of legislative and other public measures from the statistical point of view, has greatly contributed to the progress of statistical and economical science.

And Whereas distinguished individuals in foreign countries, as well as many eminent British subjects, have availed themselves of the facilities offered by the same Society for communicating important information largely extending statistical knowledge; and the general interest now felt in Statistics has been greatly promoted and fostered by this Society.

And Whereas the same Society has, in aid of its objects, collected a large and valuable library of scientific works and charts, to which fresh accessions are constantly made; and the said Society has hitherto been supported by annual and other subscriptions and contributions to its funds, and has lately acquired leasehold premises in which the business of the said Society is carried on.

And Whereas in order to secure the property of the said Society, to extend its operations, and to give it its due position among the Scientific Institutions of Our kingdom, We have been besought to grant to Sir Rawson William Rawson, Knight Com-

mander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and to those who now are Members of the said Society, or who shall from time to time be elected Fellows of the Royal Statistical Society hereby incorporated, Our Royal Charter of Incorporation for the purposes aforesaid.

1. **Now Know Ye** that We, being desirous of encouraging a design so laudable and salutary, of Our especial grace, certain knowledge and mere motion, have willed, granted, and declared and Do by these Presents, for Us, Our heirs and successors, will, grant, and declare that the said Sir Rawson William Rawson, Knight Commander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and such other of Our loving subjects as now are Members of the said Society, or shall from time to time be elected Fellows of "The Royal Statistical Society" hereby incorporated according to such regulations or bye laws as shall be hereafter framed or enacted, and their successors, shall for ever hereafter be by virtue of these presents one body politic and corporate, by the name of "**The Royal Statistical Society,**" and for the purposes aforesaid, and by the name aforesaid, shall have perpetual succession and a common seal, with full power and authority to alter, vary, break, and renew the same at their discretion, and by the same name to sue and be sued, implead and be impleaded, answer and be answered, unto and in every Court of Us, Our heirs and successors.

2. **The** Royal Statistical Society, in this Charter hereinafter called "The Society," may, notwithstanding the statutes of mortmain, take, purchase, hold and enjoy to them and their successors a hall, or house, and any such messuages or hereditaments of any tenure as may be necessary, for carrying out the purposes of the Society, but so that the yearly value thereof to be computed at the rack rent which might be gotten for the same at the time of the purchase or other acquisition, and including the site of the said hall, or house, do not exceed in the whole the sum of Two thousand pounds.

3. **There** shall be a Council of the Society, and the said Council and General Meetings of the Fellows to be held in accordance with this Our Charter shall, subject to the provisions of this Our Charter, have entire the management and direction of the concerns of the Society.

4. **There** shall be a President, Vice-Presidents, a Treasurer or Treasurers, and a Secretary or Secretaries of the Society. The Council shall consist of the President Vice-Presidents, and not

less than twenty Councillors; and the Treasurer or Treasurers and the Secretary or Secretaries if honorary.

5. **The** several persons who were elected to be the President, Vice-Presidents, and Members of the Council of the Statistical Society at the Annual Meeting held in the month of June, One thousand eight hundred and eighty-six, shall form the first Council of the Society, and shall continue in office until the first Election of officers is made under these presents as hereinafter provided.

6. **General** Meetings of the Fellows of the Society may be held from time to time, and at least one General Meeting shall be held in each year. Every General Meeting may be adjourned, subject to the provisions of the Bye Laws. The following business may be transacted by a General Meeting, viz.:—

- (a.) The Election of the President, Vice-Presidents, Treasurer or Treasurers, Secretary or Secretaries, and other Members of the Council of the Society.
- (b.) The making, repeal, or amendment of Bye Laws.
- (c.) The passing of any proper resolution respecting the affairs of the Society.

7. **Bye Laws** of the Society may be made for the following purposes, and subject to the following conditions, viz.:—

- (a.) For prescribing the qualification and condition of tenure of office of the President; the number, qualifications, functions, and conditions of tenure of office of the Vice-Presidents, Treasurers, Secretaries, and Members of Council, and Officers of the Society; for making regulations with respect to General Meetings and Meetings of the Council and proceedings thereat, and for the election of any persons to be Honorary Fellows or Associates of the Society, and defining their privileges (but such persons, if elected, shall not be Members of the Corporation), and for making regulations respecting the making, repeal and amendment of Bye Laws, and generally for the government of the Society and the management of its property and affairs.
- (b.) The first Bye Laws shall be made at the first General Meeting to be held under these presents, and shall (amongst other things) prescribe the time for holding the first election of officers under these presents.

8. **The** General Meetings and adjourned General Meetings of the Society shall take place (subject to the rules or bye laws of the Society, and to any power of convening or demanding a

Special General Meeting thereby given) at such times and places as may be fixed by the Council.

9. **The** existing rules of the Statistical Society, so far as not inconsistent with these presents, shall be in force as the Bye Laws of the Society until the first Bye Laws to be made under these presents shall come into operation.

10. **Subject** to these presents and the Bye Laws of the Society for the time being, the Council shall have the sole management of the income, funds, and property of the Society, and may manage and superintend all other affairs of the Society, and appoint and dismiss at their pleasure all salaried and other officers, attendants, and servants as they may think fit, and may do all such things as shall appear to them necessary or expedient for giving effect to the objects of the Society.

11. **The** Council shall once in every year present to a General Meeting a report of the proceedings of the Society, together with a statement of the receipts and expenditure, and of the financial position of the Society, and every Fellow of the Society may, at reasonable times to be fixed by the Council, examine the accounts of the Society.

12. **The** Council may, with the approval of a General Meeting, from time to time appoint fit persons to be Trustees of any part of the real or personal property of the Society, and may make or direct any transfer of such property so placed in trust necessary for the purposes of the trust, or may, at their discretion, take in the corporate name of the Society conveyances or transfers of any property capable of being held in that name. Provided that no sale, mortgage, incumbrance, or other disposition of any hereditaments belonging to the Society shall be made unless with the approval of a General Meeting.

13. **No** Rule, Bye Law, Resolution, or other proceeding shall be made or had by the Society, or any meeting thereof, or by the Council, contrary to the general scope or true intent and meaning of this Our Charter, or the laws or statutes of Our Realm, and anything done contrary to this present clause shall be void.

In witness whereof We have caused these Our Letters to be made Patent.

Witness Ourselves, at Westminster, the thirty-first day of January, in the fiftieth year of Our Reign.

By Warrant under the Queen's Sign Manual,

L. S.

MUIR MACKENZIE.

ROYAL STATISTICAL SOCIETY.

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BYE-LAWS OF THE ROYAL STATISTICAL SOCIETY.

Objects of the Society.

1. The objects of the Royal Statistical Society are to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method.

The Society collects new materials, condenses, arranges, and publishes those already existing, whether unpublished or published in diffuse and expensive forms in the English or in any foreign language, and promotes the discussion of legislative and other public measures from the statistical point of view. These discussions form portions of the published Transactions of the Society.

Constitution of the Society.

2. The Society consists of Fellows and Honorary Fellows, elected in the manner hereinafter described.

Number of Fellows and Honorary Fellows.

3. The number of Fellows is unlimited. Foreigners or British subjects of distinction residing out of the United Kingdom may be admitted as Honorary Fellows, of whom the number shall not be more than seventy at any one time.

Proposal of Fellows.

4. Every Candidate for admission as a Fellow of the Society shall be proposed by two or more Fellows, who shall certify from their personal knowledge of him or of his works, that he is a fit person to be admitted a Fellow of the Society. Every such certificate having been read and approved of at a Meeting of the Council, shall be suspended in the office of the Society until the following Ordinary Meeting, at which the vote shall be taken.

Election of Fellows.

5. In the election of Fellows, the votes shall be taken by ballot. No person shall be admitted unless at least sixteen Fellows vote, and unless he

have in his favour three-fourths of the Fellows voting.

Admission of Fellows.

6. Every Fellow elect is required to take the earliest opportunity of presenting himself for admission at an Ordinary Meeting of the Society.

The manner of admission shall be thus:—

Immediately after the reading of the minutes, the Fellow elect, having first paid his subscription for the current year or his composition, shall sign the obligation contained in the Fellowship-book, to the effect following:—

“We, who have underwritten our names, do hereby undertake, each for himself, that we will endeavour to further the good of the Royal Statistical Society for improving Statistical Knowledge, and the ends for which the same has been founded; that we will be present at the Meetings of the Society as often as conveniently we can, and that we will keep and fulfil the Bye-laws and Orders of this Society: provided that whensoever any one of us shall make known, by writing under his hand, to the Secretaries for the time being, that he desires to withdraw from the Society, he shall be free thenceforward from this obligation.”

Whereon the President, taking him by the hand, shall say,—“By the authority, and in the name of the Royal Statistical Society, I do admit you a Fellow thereof.”

Upon their admission Fellows shall have the right of attaching to their names the letters F.S.S., but not in connection with any trading or business advertisement other than the publication of any book or literary notice.

Admission of Honorary Fellows.

7. There shall be Two Meetings of the Society in the year, on such days as shall be hereafter fixed by the Council, at which Honorary Fellows may be elected.

No Honorary Fellow can be recommended for election but by the Council. At any Meeting of the Council any Member thereof may propose a Foreigner or

British subject of distinction residing out of the United Kingdom, delivering at the same time a written statement of the qualifications of, offices held by, and published works of, the person proposed; and ten days' notice at least shall be given to every Member of the Council, of the day on which the Council will vote by ballot on the question whether they will recommend to the Society the election of the person proposed. No such recommendation to the Society shall be adopted unless at least three-fourths of the votes are in favour thereof.

Notice of the recommendation shall be given from the chair at the Meeting of the Society next preceding that at which the vote shall be taken thereon. No person shall be elected an Honorary Fellow unless sixteen Fellows vote and three-fourths of the Fellows voting be in his favour.

The Council shall have power to elect as Honorary Fellows, the Presidents for the time being of the Statistical Societies of Dublin, Manchester, and Paris, and the President of any other Statistical Society at home or abroad.

Payments by Fellows.

8. Every Fellow of the Society shall pay a yearly subscription of Two Guineas, or may at any time compound for his future yearly payments by paying at once the sum of Twenty Guineas.* unless the Annual Subscription or Composition Fee shall be remitted by the Council; provided that the number of Fellows whose Annual Subscription or Composition Fee shall have been thus remitted, do not exceed five at any one time.

Every person elected to the Society shall pay his first subscription (or if he desire to become a Life Fellow, his composition) within three months at the latest of the date of his election, if he be resident in the United Kingdom. If he be resident abroad, this period shall be six months. If payment be not made within the time specified above, the election shall be void.

Defaulters.—Withdrawal of Fellows.

9. All yearly payments are due in

advance on the 1st of January, and if any Fellow of the Society have not paid his subscription before the 1st of July, he shall be applied to in writing by the Secretaries, and if the same be not paid before the 1st of January of the second year, a written application shall again be made by the Secretaries, and the Fellow in arrear shall cease to receive the Society's publications, and shall not be entitled to any of the privileges of the Society until such arrears are paid; and if the subscription be not discharged before the 1st of February of the second year, the name of the Fellow thus in arrear shall be exhibited on a card suspended in the office of the Society; and if, at the next Annual General Meeting, the amount still remain unpaid, the defaulter shall, unless otherwise authorised by the Council, be announced to be no longer a Fellow of the Society, the reason for the same being at the same time assigned. No Fellow of the Society can withdraw his name from the Society's books, unless all arrears be paid; and no resignation will be deemed valid unless a written notice thereof be communicated to the Secretaries. No Fellow shall be entitled to vote at any Meeting of the Society until he shall have paid his subscription for the current year.

Expulsion of Fellows.

10. If any Fellow of the Society, or any Honorary Fellow, shall so demean himself that it would be for the dishonour of the Society that he longer continue to be a Fellow or Honorary Fellow thereof, the Council shall take the matter into consideration; and if the majority of the Members of the Council present at some Meeting (of which and of the matter in hand such Fellow or Honorary Fellow, and every Member of the Council, shall have due notice) shall decide by ballot to recommend that such Fellow or Honorary Fellow be expelled from the Society, the President shall at its next Ordinary Meeting announce to the Society the recommendation of the Council, and at the following Meeting the question shall be decided by ballot, and if at least three-fourths of the

* Cheques should be made payable to "The Royal Statistical Society," and crossed "Messrs. Drummond and Co."

number voting are in favour of the expulsion, the President shall forthwith cancel the name in the Fellowship-book, and shall say,—

“By the authority and in the name of the Royal Statistical Society, I do declare that A. B. (naming him) is no longer a Fellow (or Honorary Fellow) thereof.”

And such Fellow or Honorary Fellow shall thereupon cease to be of the Society.

Trustees.

11. The property of the Society may be vested in three Trustees, chosen by the Fellows. The Trustees are eligible to any other offices in the Society.

President, Council, and Officers.

12. The Council shall consist of a President and thirty Members, together with the Honorary Vice-Presidents.

From the Council shall be chosen four Vice-Presidents, a Treasurer, the Honorary Secretaries, and a Foreign Secretary, who may be one of the Honorary Secretaries. The former Presidents who are continuing Fellows of the Society shall be Honorary Vice-Presidents. Any five of the Council shall be a quorum.

Election of President and Officers.

13. The President, Members of Council, Treasurer, and Honorary and Foreign Secretaries shall be chosen annually by the Fellows at the Annual General Meeting.

The Vice-Presidents shall be chosen annually from the Council by the President.

The President shall not be eligible for the office more than two years in succession.

Six Fellows, at least, who were not of the Council of the previous year, shall be annually elected; and of the Members retiring three at least shall be those who have served longest continuously on the Council, unless they hold office as Treasurer or Honorary or Foreign Secretary.

Nomination of President, Council, and Officers.

14. The Council shall, previously to the Annual General Meeting, nominate, by ballot, the Fellows whom they recommend to be the next President and

Council of the Society. They shall also recommend for election a Treasurer and the Secretaries (in accordance with Rule 12). Notice shall be sent to every Fellow whose residence is known to be within the limits of the metropolitan post, at least a fortnight before the Annual General Meeting, of the names of Fellows recommended by the Council.

Extraordinary Vacancies.

15. On any extraordinary vacancy occurring of the Office of President, or other Officer of the Society, the Honorary Secretaries shall summon the Council with as little delay as possible, and a majority of the Council, thereupon meeting in their usual place, shall, by ballot, and by a majority of those present, choose a new President, or other Officer of the Society, to be so until the next Annual General Meeting.

Committees.

16. The Council shall have power to appoint Committees of Fellows and also an Executive Committee of their own body. The Committees shall report their proceedings to the Council. No report shall be communicated to the Society except by the Council.

Auditors.

17. At the first Ordinary Meeting of each year, the Fellows shall choose two Fellows, not being Members of the Council, as Auditors, who, with one of the Council, chosen by the Council, shall audit the Treasurer's accounts for the past year, and report thereon to the Society, which report shall be presented at the Ordinary Meeting in February. The Auditors shall be empowered to examine into the particulars of all expenditure of the funds of the Society, and may report their opinion upon any part of it.

Meetings Ordinary and General.

18. The Ordinary Meetings of the Society shall be held monthly, or oftener, during the Session, which shall be from the 1st of November to the 1st of July in each year, both inclusive, on such days and at such hours as the Council shall declare. The Annual General Meeting shall be held on such day in the month of June of each year as shall be appointed by the Council for the time being.

Business of Ordinary Meetings.

19. The business of the Ordinary Meetings shall be to elect and admit Fellows, to read and hear reports, letters, and papers on subjects interesting to the Society. Nothing relating to the bye-laws or management of the Society shall be discussed at the Ordinary Meetings, except that the Auditors' Report shall be presented at the Ordinary Meeting in February, and that the Minutes of the Annual General Meeting, and of every Special General Meeting, shall be submitted for confirmation at the next Ordinary Meeting after the day of such Annual or Special General Meeting. Strangers may be introduced to the Ordinary Meetings, by any Fellow, with the leave of the President, Vice-President, or other Fellow presiding at the Meeting.

Business of Annual General Meeting.

20. The business of the Annual General Meeting shall be to elect the Officers of the Society, and to discuss questions on its bye-laws and management. No Fellow or Honorary Fellow shall be proposed at the Annual General Meeting. No Fellow shall propose any alteration of the rules or bye-laws of the Society at the Annual General Meeting, unless after three weeks' notice thereof given in writing to the Council, but amendments to any motion may be brought forward without notice, so that they relate to the same subject as the motion. The Council shall give fourteen days' notice to every Fellow of all questions of which such notice shall have been given to them.

Special General Meetings.

21. The Council may, at any time, call a Special General Meeting of the Society when it appears to them necessary. Any twenty Fellows may require a Special General Meeting to be called, by notice in writing signed by them, delivered to one of the Secretaries, specifying the questions to be moved. The Council shall, within one week of such notice, appoint a day for such Special General Meeting, and shall give at least one week's notice of every Special General Meeting, and of the questions to be moved, to every Fellow

within the limits of the metropolitan post, whose residence is known. No business shall be brought forward at any Special General Meeting other than that specified in the notice convening the same.

Duties of the President.

22. The President shall preside at all Meetings of the Society, Council, and Committees which he shall attend, and in case of an equality of votes, shall have a second or casting vote. He shall sign all diplomas of admission of Honorary Fellows. He shall admit and expel Fellows and Honorary Fellows, according to the bye-laws of the Society.

Duties of the Treasurer.

23. The Treasurer shall receive all moneys due to, and pay all moneys owing by, the Society, and shall keep an account of his receipts and payments. No sum exceeding Ten Pounds shall be paid but by order of the Council, excepting always any lawful demand for rates or taxes. The Treasurer shall invest the moneys of the Society in such manner as the Council shall from time to time direct.

Duties of the Honorary Secretaries.

24. The Honorary Secretaries shall, under the control of the Council, conduct the correspondence of the Society; they or one of them shall attend all Meetings of the Society and Council, and shall duly record the Minutes of the Proceedings. They shall issue the requisite notices, and read such papers to the Society as the Council may direct.

Powers of the Vice-Presidents.

25. A Vice-President, whether Honorary or nominated, in the chair, shall act with the power of the President in presiding and voting at any Meeting of the Society or Council, and in admitting Fellows; but no Vice-President shall be empowered to sign diplomas of admission of Honorary Fellows, or to expel Fellows or Honorary Fellows. In the absence of the President and Vice-Presidents, any Member of Council may be called upon by the Fellows then present, to preside at an Ordinary or Council Meeting, with the same power as a Vice-President.

Powers of the Council.

26. The Council shall have control over the papers and funds of the Society, and may, as they shall see fit, direct the publication of papers and the expenditure of the funds, in accordance with the provisions of the Charter.

27. The Council shall be empowered at any time to frame Regulations not inconsistent with these bye-laws, which shall be and remain in force until the next Annual General Meeting, at which they shall be either affirmed or annulled; but no Council shall have power to renew Regulations which have once been disapproved at an Annual General Meeting.

28. The Council shall have the custody of the Common Seal. The Common Seal shall not be affixed to any instrument, deed, or other document, except by order of the Council and in the presence of at least two Members

of the Council and in accordance with such other regulations as the Council shall from time to time prescribe. The fact of the seal having been so affixed shall be entered on the minutes of the Council.

29. No Dividend, Gift, Division, or Bonus in money shall be made by the Society, unto or between any of the Fellows or Members, except as hereinafter provided.

30. The Council shall publish a Journal of the Transactions of the Society, and such other Statistical Publications as they may determine upon, and may from time to time pay such sums to Editors and their assistants, whether Fellows of the Society or not, as may be deemed advisable.

31. All communications to the Society are the property of the Society, unless the Council allow the right of property to be specially reserved by the Contributors.

REGULATIONS OF THE LIBRARY.

1. The Library and the Reading Room are open daily for the use of Fellows from 10 a.m. till 5 p.m., except on Saturdays, when they are closed at 2 p.m.

2. No Fellow, other than an Officer of the Society, is entitled to use the address of the Society in any communication to the Public Press.

3. Fellows of the Society are permitted to take out books on making personal application, or by letter addressed to the Librarian, all expenses for carriage being paid by the Fellows.

4. No Fellow shall have more than ten volumes out at any one time. Fellows are not to keep any books longer than one month. Any Fellow detaining a book for more than a month shall not be permitted to take another from the Library until the book detained shall have been returned.

On the termination of the year for which the subscription has not been paid, a Fellow whose payment is in arrear shall cease to have the privilege of using the Library or of borrowing books therefrom.

5. Scientific Journals and Periodicals are not circulated until the volumes are completed and bound.

6. Cyclopædias and works of reference are not circulated, but may be lent on the written order of an Honorary Secretary for a period not exceeding *seven* days. The Assistant Secretary or Librarian is allowed at his discretion to lend works of reference for a period not exceeding *three* days, reporting at the same time to the Honorary Secretaries. If works so lent be not returned within the specified time, the borrower shall incur a fine of one shilling per day per volume for each day they are detained beyond the time specified.

7. Any Fellow who damages or loses a book, shall either replace the work, or pay a fine equivalent to its value.

8. Books taken from the shelves for reference, are *not* to be replaced, but must be laid on the Library table.

9. The Librarian shall report to the Council any infringement of these regulations, and lay upon the table at each regular Meeting (*a*) a List of any "Works of Reference" that may have been borrowed, and (*b*) a List of Books that have been out more than a month.

DONORS TO THE LIBRARY.

DURING THE YEAR (ENDING 15TH SEPTEMBER) 1905.

(a) Foreign Countries.

Argentine Republic—

General Statistical Bureau.

Ministry of Agriculture.

„ Interior.

National Health Department.

Buenos Ayres. Provincial and
Municipal Statistical Bureaus.

Santa-Fe Statistical Bureau.

Tucumán Statistical Bureau.

Argentine Year Book, The Pub-
lishers.*Austria and Hungary—*

Central Statistical Commission.

Ministry of Agriculture.

„ Finance.

„ Railways.

Statistical Department of the
Ministry of Commerce.

Austrian Labour Department.

Bohemian Statistical Bureau.

Bosnia and Herzegovina Sta-
tistical Bureau.

Bukowina Statistical Bureau.

Hungarian Statistical Bureau.

Brüm Statistical Bureau.

Budapest Statistical Bureau.

Prague Statistical Bureau.

Vienna Health Department.

“Compass,” The Publisher.

Belgium—

Army Medical Department.

Bureau of General Statistics.

Belgian Labour Department.

„ Legation, London.

Bruges. The Burgomaster.*Brussels* Bureau of Hygiene.*Hasselt.* The Burgomaster.

Royal Academy of Sciences.

Institute of Sociology.

Brazil. The Statistical Bureau.*Bulgaria.* Statistical Bureau.*Chile—*

The Central Statistical Bureau.

The Superintendent of Customs.

China. Imperial Maritime Customs.*Cuba.* National Library of Cuba.*Denmark—*

State Statistical Bureau.

Copenhagen Statistical Bureau.

Political Economy Society.

Egypt—

The Egyptian Government.

Department of Public Health.

Director-General of Customs.

„ Post Office.

Ministry of Finance.

Comité de Conservation de
Monuments de l'Art Arabe.

Public Debt Office.

France—

Director-General of Customs.

Director of the Mint.

French Labour Department.

Ministry of Agriculture.

„ The Colonies.

„ Finance.

„ The Interior.

„ Justice.

„ Public Instruction.

„ Public Works.

Paris Statistical Bureau.

Economiste Français, The Editor.

Journal des Economistes, The
Editor.

During the Year 1904-05—Contd.(a) **Foreign Countries—Contd.***France—Contd.*

Monde Economique, The Editor.
 Polybiblion, Revue Bibliographique Universelle, The Editor.
 Réforme Sociale, The Editor.
 Rentier, Le, The Editor.
 Revue d'Economie Politique, The Editor.
 Revue de Statistique, The Publisher.
 The Bank of France.
 Statistical Society of Paris.

Germany—

Imperial Health Bureau.
 „ Insurance Bureau.
 „ Judicial Bureau.
 „ Statistical Bureau.
 German Consul-General, London.
 Prussian Royal Statistical Bureau.
 Saxony Royal Statistical Bureau.
 Berlin Statistical Bureau.
 Breslau Statistical Bureau.
 Frankfort Chamber of Commerce.
 Frankfort Statistical Bureau.
 Hamburg Statistical Bureau.
 Nuremberg Statistical Bureau.
 Allgemeines Statistisches Archiv, The Editor.
 Archiv für Rassen- und Gesellschafts-Biologie, The Editor.
 Archiv für Soziale-wissenschaft und Sozialpolitik, &c., The Editor.
 Jahrbuch für Gesetzgebung, &c., The Editor.
 Jahrbücher für Nationalökonomie und Statistik, The Editor.
 Zeitschrift für die gesamte Staatswissenschaft, The Editor.
 Zeitschrift für Socialwissenschaft, The Editor.
 Geographical and Statistical Society of Frankfort.
 Metallgesellschaft, The.

Germany—Contd.

Verein für Versicherungs-Wissenschaft.

Greece—

Statistical Bureau.
 International Finance Commission.

Italy—

Director-General of Agriculture.
 „ Customs.
 „ Statistics.
 Italian Labour Department.
 Ministry of Finance.
 Florence Statistical Bureau.
 Economista, The Editor.
 Giornale degli Economisti, The Editor.
 Rivista Italiana di Sociologia, The Editor.
 Societa Umanitaria.

Japan—

Consul-General, London.
 Bureau of General Statistics.
 Department of Agriculture and Commerce.
 Department of Finance.

Mexico—

Statistical Bureau.

Netherlands—

Central Health Bureau.
 „ Statistical Bureau.
 Department of Finance.
 „ the Interior.
 „ Waterstaat, &c.
 Director-General of Customs.

Norway—

Central Statistical Bureau.
 Christiania Health Department.
 „ Statistical Bureau.

Paraguay. Asuncion Chamber of Commerce.

During the Year 1904-05—Contd.(a) **Foreign Countries—Contd.**

Portugal. General Statistical Bureau.

Roumania—

Ministry of Finance.
Statistical Bureau.
Bucharest Municipal Statistical Bureau.

Russia—

Central Statistical Committee.
Controller of the Empire.
Customs Statistical Bureau.
Department of Agriculture.
Ministry of Finance.
Justice.
Moscow Statistical Bureau.
Russian Journal of Financial Statistics, The Editor.
Finland Statistical Bureau.

Salvador—

Health Department.
Statistical Bureau.

Servia—

Statistical Bureau.
Department of Customs.

Spain—

Director-General of Customs.
Geographical and Statistical Institute.
Ministry of Agriculture.
Statistical Bureau of Madrid.
Barcelona Statistical Bureau.

Sweden—

Central Statistical Bureau.
Stockholm Health Department.
Royal University of Upsala.
Swedish Consul General, London.

Switzerland—

Federal Assurance Bureau.
„ Statistical Bureau.
„ Department of Customs.
Federal Department of Finance.
“Régie federale des Alcools.”

Switzerland—Contd.

Statistical Society.
Swiss Union of Commerce and Industry.

United States—

Bureau of Education.
„ Immigration.
„ Navigation.
Census Bureau.
Commissioner of Labor.
Commissioner-General for Emigration.
Comptroller of the Currency.
Department of Agriculture.
„ Commerce and Labour.
Director of Geological Survey.
Interstate Commerce Commission.
Naval Observatory.
War Department.
Secretary of the Treasury.
„ Interior.
Surgeon-General, U. States Army.
California. Bureau of Labor Statistics.
Colorado University.
Connecticut—
State Board of Health.
Bureau of Labor Statistics.
Illinois. Bureau of Labor Statistics.
Indiana. Department of Statistics.
Iowa. Bureau of Labor Statistics.
Kansas. Bureau of Labor Statistics.
Maine. Bureau of Labor and Industrial Statistics.
Maryland. Bureau of Statistics and Information.
Massachusetts—
Board of Arbitration.
„ Health, Lunacy, &c.
Bureau of Labor Statistics.
Metropolitan Water Board.

*During the Year 1904-05—Contd.***(a) Foreign Countries—Contd.***United States—Contd.**Michigan—*

Bureau of Labor and Industrial Statistics.

Division of Vital Statistics.

Minnesota. Bureau of Labor Statistics.

Missouri. Bureau of Labor Statistics.

Nebraska. Bureau of Labor and Industrial Statistics.

New Hampshire. Bureau of Labor Statistics.

New Jersey. Bureau of Labor Statistics.

New York State Library.

„ Bureau of Labor Statistics.

„ State University.

North Carolina. Bureau of Labor Statistics.

Ohio. Bureau of Labor Statistics.

Pennsylvania. Bureau of Industrial Statistics.

Wisconsin—

Bureau of Labor Statistics.

State Board of Health.

Boston Metropolitan Water and Sewerage Board.

Boston Statistical Bureau.

Boston Public Library.

New York City Public Library.

Bankers' Magazine, The Editor.

Bradstreet's Journal, The Editor.

Commercial and Financial Chronicle, The Editor.

United States—Contd.

Journal of Political Economy, The Editor.

Political Science Quarterly, Columbia University, The Editor.

Quarterly Journal of Economics, The Editor.

Yale Review, The Editor

Actuarial Society of America.

American Academy of Arts and Sciences.

American Academy of Political and Social Science.

American Economic Association.

American Geographical Society.

American Philosophical Society.

American Statistical Association.

Philadelphia Commercial Museum.

Columbia University, New York.

John Crerar Library.

Johns Hopkins University.

Smithsonian Institution.

Colorado University.

Uruguay—

Statistical Bureau.

Director of Civil Registration.

Montevideo Statistical Bureau.

Uruguayan Chargé d'Affaires, London.

Venezuela. Statistical Bureau.

International. L'Institut International de Bibliographie.

(b) India, and Colonial Possessions.*India, British—*

Secretary of State in Council.

Census Commissioner.

Chief Inspector of Mines.

Director-General of Statistics.

Finance and Commerce Department.

India, British—Contd.

Geological Survey.

Imperial Library.

Lieutenant-Governor of Bengal.

Bengal, The Collector of Customs.

Sanitary Commissioner for Punjab

*During the Year 1904-05—Contd.***(b) India, and Colonial Possessions—Contd.***India, British—Contd.*

East India Railway.
 Indian Engineering, The Editor.
 Asiatic Society of Bengal.
 Bombay Branch of the Royal
 Asiatic Society.

Canada—

The High Commissioner.
 Census Commissioner.
 Clerk of House of Commons.
 Minister of Labour.
 Department of Agriculture.
 Deputy Minister of Finance.
British Columbia. Department
 of Mines.

Ontario Bureau of Industries.

Manitoba. Department of Pub-
 lic Works.

„ The King's Printer.

North-West Territories—

Department of Agriculture.
 Royal Society of Canada.
 The Royal Bank of Canada.

Cape of Good Hope—

Agent-General for the Cape.
 Colonial Secretary.
 Director of the Census.
 Registrar-General.

Ceylon—

Lieut.-Governor and Colonial
 Secretary.
 General Manager of Government
 Railways.

Jamaica. Registrar-General.

Mauritius—

The Colonial Secretary.
 Registrar-General.

Natal. The Colonial Secretary.

New South Wales—

Agent-General, London.
 Controller-General of Prisons.
 Government Statistician.
 Registrar-General.
 Registrar of Friendly Societies.
 Railway Commissioners, Sydney.

New Zealand—

Agent-General, London.
 Registrar-General.
 Registrar of Friendly Societies.
 Life Insurance Department.
 Labour Department.
 New Zealand Institute.
 Trade Review, The Editor.
 Wellington Harbour Board.
 Registrar of Old Age Pensions.

Orange River Colony. Auditor-
 General.

Queensland—

Agent-General, London.
 The Government Statistician.
 Registrar-General.

Rhodesia—

British South Africa Company.
 Chamber of Mines.

South Australia—

Agent-General, London.
 The Chief Secretary.
 The Registrar-General.
 Government Statist.
 Public Actuary.
 Public Library.

Straits Settlements. The Govern-
 ment Secretary, Perak.

Tasmania—

The Agricultural Department.
 The Agent-General, London.
 Government Railways Depart-
 ment.

*During the Year 1904-05—Contd.***(b) India and Colonial Possessions—Contd.***Tasmania—Contd*

Government Statistician.
Mines Department.
Royal Society of Tasmania.

Transvaal—

Agricultural Department.
Department of Mines.
Johannesburg Town Statistician.
Chamber of Mines.

Victoria—

Agent-General, London.
Government Statistician.

Victoria—Contd.

Registrar for Friendly Societies.
Public Library, &c., Melbourne.

Western Australia—

Agent-General, London.
The Government Actuary.
Acting Collector of Customs.
The Government Statistician.
Registrar-General.
Department of Mines.
Superintendent of Census.

Australia, Commonwealth of. Department of Trade and Customs.

(c) United Kingdom and its several Divisions.*United Kingdom—*

Admiralty Medical Department.
Army Medical Department.
Board of Agriculture and Fisheries.
Board of Trade.
British Museum.
Colonial Office.
Companies in Liquidation, Inspector-General of.
Customs, Commissioners of.
Factories and Workshops, Chief Inspector of.
Friendly Societies, Registrar of.
Home Office.
India Office.
Inland Revenue, The Commissioners.
Inspector-General in Bankruptcy.
Joint Stock Companies, The Registrar of.
Labour Department, Board of Trade.
Local Government Board.
Royal Mint.
Woods, Forests, &c., H.M. Commissioners.
Tariff Commission.

England—

Registrar-General of England.
London, Corporation of.
„ County Council.
„ „ Education Committee.
„ University.
Metropolitan Asylums Board.
„ Commissioner of Police.
Battersea, The Borough Council.
Wandsworth, The Borough Council.
Birmingham City Treasurer.
Folkestone, Borough Accountant.
Leicester Borough Treasurer.
Manchester, The Town Clerk.
„ Free Public Library.
Mansion House Council on Dwellings of the Poor.
Mersey Conservancy.
Nottingham City Accountant.
Paddington Medical Officer of Health.
Poplar Medical Officer of Health.
Tunbridge Wells, The Borough Accountant.
West Hartlepool, The Borough Accountant.

During the Year 1904-05—Contd.(c) **United Kingdom and its several Divisions—Contd.***England—Contd.*

The Medical Officer of Health of the Local Government Board and of the following towns: Birkenhead, Birmingham, Bolton, Bradford, Brighton, Bristol, Cardiff, Derby, Halifax, Huddersfield, Hull, Leeds, Leicester, Liverpool, Manchester, Newcastle-on-Tyne, Norwich, Nottingham, Preston, Salford, Stafford, Sunderland,

England—Contd.

West Hartlepool, Wigan, Wolverhampton.

Ireland—

Department of Agriculture.
Registrar-General of Ireland.

Scotland—

Education Department.
Registrar-General of Scotland.
Edinburgh City Chamberlain.
Aberdeen Medical Officer.
Glasgow Medical Officer.

(d) **Authors, &c.**

Ababrelton, R., Natal.
Aeworth, W. M., M.A., London.
Adeane, C., Babraham, Cambridge.
Amalgamated Press, Ltd., London.
Angier Bros., London.
Anthony, Edwyn, London.
Atkinson, Edward, U.S.A.
Back, Frederick, Tasmania.
Bamber, Lieut.-Col. C. J., India.
Barnes, Hon. William, U.S.A.
Belago, His Excellency D., St. Petersburg.
Bertillon, Dr. J., Paris.
Biedermann, E., Berlin.
Blenck, Herr E., Berlin.
Bodio, Professor Luigi, Rome.
Booth, Charles, London.
Boutcher, Mortimore, & Co., London.
Brabrook, Sir E. W., C.B., London.
Broomhall, G. J. S., Liverpool.
Buckley, T. J. W., London.
Caillard, Sir Vincent H. P.
Campbell, Richardson, Manchester.
Clarendon Press, Oxford.
Clarke, Sir Ernest, London.
Coghlan, T. A., London.
Coleseo, L., Roumania.
Conrad, Dr. J., Jena.
Constable, A., & Co., London.

Cook-Watson, Ralph.
Cooper, Joseph, Farnworth.
Court, S. E., Johannesburg.
Courtney, J. M., Canada.
Craigie, Major P. G., C.B., London.
Cunningham, Dr. W., Cambridge.
Dalla Volta, Riccardo, Florence.
Deane, Albert B., London.
Dechesne, L., Paris.
De la Plaza, V., London.
Doyle, Patrick, Calcutta.
Dujarric et Cie., Paris.
Dunker & Humblot, Messrs., Leipzig.
Eaton, H. W., & Sons, London.
Ellison & Co., Liverpool.
Feldt, Wladimir, St. Petersburg.
Ferraris, Carlo F., Rome.
Figgis, S., & Co., London.
Fischer, Herr Gustav, Jena.
Fleming, Owen, London.
Fornasari di Verce, E., Italy.
Forster, John W., Nottingham.
Foville, A. de, Paris.
Fry, T. Hallett, London.
Galwey, C. E.
Gooch, Thomas & Sons, London.
Gouge, H. Dillon, Adelaide.
Gow, Wilson, & Stanton, London.

During the Year 1904-05—Contd.(d) **Authors, &c.—Contd.**

- | | |
|--|------------------------------------|
| Grubb, Edward, London. | Lowenthal, Dr., Paris. |
| Guillaume, Dr. Louis, Bern. | Macleaue & Henderson, Messrs., |
| Guillaumin et Cie., Paris. | London. |
| Guyot, Yves, Paris. | Macmillan & Co., London. |
| Haggard, F. T., Tunbridge Wells. | Macquart, Emile. |
| Hall, Thomas, New South Wales. | March, Lucien, Paris. |
| Hart, Sir R., Bart., G.C.M.G., Peking. | Matheson, R. E., London. |
| Hayward, T. E., St. Helens. | Mayr, Dr. G. von, Strassburg. |
| Hector, Sir James, New Zealand. | Methuen & Co., London. |
| Helmuth Schwartz & Co., London. | Mitchell & Co., London. |
| Hodgson, W. Gill, West Hartlepool. | Molt, C. G. |
| Hutton, J. A., Manchester. | Morgan, Percy C., London. |
| Hyde, Hon. John, U.S.A. | Moss, R. J., & Co., Egypt. |
| Inama-Sternegg, Dr. K. T., Vienna. | Neymarck, A., Paris. |
| Ireland, Alleyne, Boston, U.S.A. | Oberlé, Ernest, Odessa. |
| Jacquart, Camille. | Oldham, J., Buenos Ayres. |
| Johnson, Geo., Ottawa. | Owen, Edgar T., W. Australia. |
| Johnston, R. M., Hobart. | Owen & Co., London. |
| Juraschek, Dr. F. v., Vienna. | Page & Gwyther, London. |
| Keltie, J. Scott, London. | Paulin, David, Edinburgh. |
| Kemp, John, London. | Penn-Lewis, W., Leicester. |
| Kennedy, Sir Charles M., Exmouth. | Petersilie, Dr. A., Berlin. |
| Keynes, John N., Cambridge. | Pickenbroek, Carl, Lausanne. |
| Kier, A. N., Christiania. | Pierson, Israel C., New York. |
| King, A. W. W., London. | Pigon, A. C., Cambridge. |
| King, P. S., & Son, Westminster. | Pittar, Sir T. J., K.C.B., London. |
| King, W. A., Liberia. | Pixley & Abell, London. |
| Körösi, Joseph, Budapest. | Pochaji, P. C., Bombay. |
| Kovanko, Mlle. A., St. Petersburg. | Porter, Hon. R. P., London. |
| Lahitte, Emilio, Buenos Aires. | Powell, T. J., & Co., London. |
| Latzina, Dr. F., Buenos Ayres. | Price, L. L., Oxford. |
| Layton, C. & E., London. | Raffalovich, Arthur, Paris. |
| Lawson, W. R., London. | Ranke, Dr. K. E. |
| Leroy-Beaulieu, Paul, Paris. | Rew, R. Henry, London. |
| Levasseur, E., Paris. | Robertson, G., New Zealand. |
| Levy, Dr. H., Berlin. | Robertson, J. A., Calcutta. |
| Lexis, Prof. W., Germany. | Ronald & Rodger, Liverpool. |
| Lib. Gen. de Droit et de Jurispru- | Rosenbaum, S., London. |
| dence, Paris. | Rowntree, Joseph, York. |
| Licht, Herr, Magdeburg. | Rozenraad, C., London. |
| Licht, O., Magdeburg. | Schmoller, Dr. G., Germany. |
| Livi, Ridolfo, Rome. | Scott, W. R. |
| Loescher et Cie., Rome. | Seyd, Richard, London. |
| Longmans & Co., London. | Shepherd, W. P. B., London. |
| Longstaff, G. B., London. | Shillito, J., York. |

*During the Year 1904-05—Contd.***(d) Authors, &c.—Contd.**

Sidenbladh, Dr. K., Stockholm.	Urmson, Elliot, & Co., Liverpool.
Stanton, A. G., London.	Vivian, Younger & Bond, London.
Stoppelaar, N., Brussels.	Waxweiler, Prof. E., Brussels.
Supino, Camillo, Pavia.	Weddel & Co., London.
Tattersall, William, Manchester	Welton, Thomas A., London.
Teubner, Mr. B. G.	Whitelegge, B. Arthur, London.
Thomas, Dr. J. Tubb, Trowbridge.	Williams & Norgate, London.
Thomas, Owen, London.	Wolfe, S. H., New York.
Thompson, W. J., & Co., London.	Wood, G. H., London.
Timewell, James, London.	Wright, Hon. C. D., Washington.
Troïtsky, M. N., St. Petersburg.	Yanagisawa, Count, Tokio.
Tyler, Edgar A.	

(e) Societies, &c. (British).

Accountants and Auditors, Society of.	London Chamber of Commerce.
Actuaries, Institute of.	„ Hospital.
„ Faculty of (Scotland).	„ Library.
Anthropological Institute.	„ School of Economics.
Arts, Society of.	Manchester Lit. and Phil. Society.
Bankers, Institute of.	„ Statistical Society.
British Association.	Medical Officers of Health, Incorporated Society of.
Cambridge University Press.	Middlesex Hospital.
Chartered Accountants, Institute of.	Mitchell Library, Glasgow.
Chartered Accountants of Scotland.	Navy League.
Civil Engineers, Institution of.	Peabody Donation Fund.
Cobden Club.	Royal Agricultural Society.
Co-operative Union, Limited.	„ Asiatic Society.
Corporation of Foreign Bondholders.	„ College of Physicians.
Council of the United Synagogue.	„ College of Surgeons.
East India Association.	„ Colonial Institute.
Glasgow Philosophical Society.	„ Economic Society.
Howard Association.	„ Geographical Society.
Imperial Institute.	„ Institution of Great Britain.
Incorporated Accountants' Society.	„ Irish Academy.
International Statistical Institute.	„ Meteorological Society.
Iron and Steel Institute.	„ Society, Edinburgh.
Liverpool Lit. and Phil. Society.	„ Society, London.
„ Chamber of Commerce.	„ United Service Institution.
„ Economic and Statistical Society.	St. Bartholomew's Hospital.
	Sanitary Institute of Great Britain.
	Society of Comparative Legislation.

During the Year 1904-05—Contd.(e) **Societies, &c. (British)**—*Contd.*

Society for Propagation of the Gospel in Foreign Parts.	Stock Exchange, London.
Sociological Society.	Surveyors' Institution.
Statistical and Social Inquiry Society of Ireland.	Tariff Reform League, London.
	University College, London.

(f) **Periodicals, &c. (British).** *The Editors of—*

Accountant, The, London.	Investors' Monthly Manual, The.
Appointments Gazette, Cambridge.	„ Review, The, London.
Athenæum, The, London.	Joint Stock Companies Journal.
Australian Trading World, The.	Labour Co-partnership, London.
Bankers' Magazine, The, London.	Licensing World, The, London.
Broomhall's Weekly Corn Trade News, Liverpool.	Lloyd's Register of Shipping.
Browne's Export List, Newcastle-on-Tyne.	Local Government Journal.
Celliery Guardian, The, London.	Machinery Market, The, London.
Commercial World, The, London.	Nature, London.
Economic Review, The, London.	Policy-Holder, The, Manchester.
Economist, The, London.	Post Magazine, The, London.
Finance Chronicle, The, London.	„ Almanack, London.
Fireman, The, London.	Produce Markets Review, The, London.
Free Trader, The, London.	Public Health, London.
Insurance Post, The, London.	Sanitary Record, The, London.
„ Record, The, London.	Shipping World, The, London.
	Statist, The, London.

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